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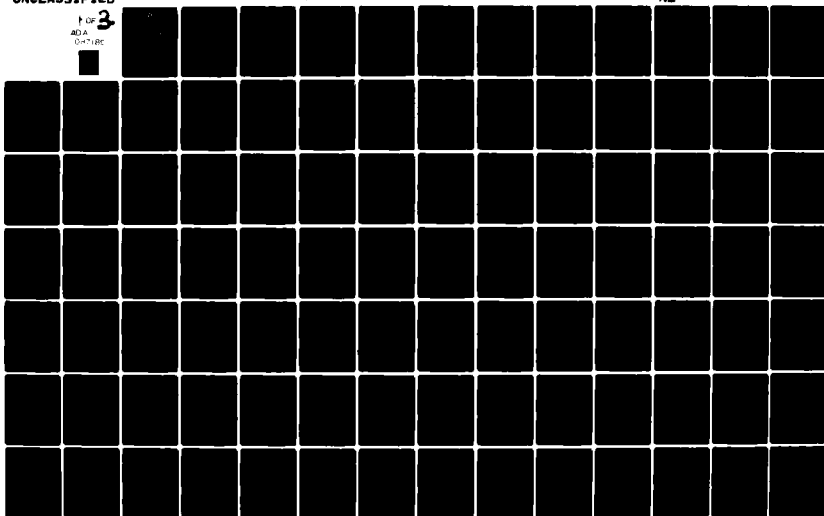
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An Illustrative Case Study for Twentieth Century Defense Planners:  
The Technology and Politics of United States Coastal Defense 1880-1898

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Final Report 24 April 1980

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A thesis submitted to Duke University, Durham, North Carolina in  
partial fulfillment of the requirements for the degree of Master of Arts  
in the Department of History.

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
	AD-A087485	
4. TITLE (and Subtitle)	5. TYPE OF REPORT & PERIOD COVERED	
(6) An Illustrative Case Study for Twentieth Century Defense Planners: The Technology and Politics of United States Coastal Defense, 1880-1898	(9) Final report, 24 April 1980	
7. AUTHOR(s)	6. PERFORMING ORG. REPORT NUMBER	
(10) Kenneth Earl/Hamburger		
9. PERFORMING ORGANIZATION NAME AND ADDRESS	8. CONTRACT OR GRANT NUMBER(s)	
Kenneth Earl Hamburger, HQDA, MILPERCEN (DAPC-OPP-E), 200 Stovall Street, Alexandria, VA 22332	(11) 24 Apr 80 /	
11. CONTROLLING OFFICE NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
	(12) 1721	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	12. REPORT DATE	
	24 April 1980	
	13. NUMBER OF PAGES	
	164	
	15. SECURITY CLASS. (of this report)	
	Unclassified	
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE	
16. DISTRIBUTION STATEMENT (of this Report)		
Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
Thesis completed at Duke University.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
Architecture, Military/Military Architecture Coastal Defenses/Coast Defenses/Defenses, Coast Defense Planning/Planning, Defense Artillery, Coast		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
<p>Three critical groups of individuals determine what U.S. defenses will be at any time: "publicists" recommend defensive measures; "planners" translate recommendations into legislative proposals; "politicians" decide which proposals will be funded. National welfare is the rational basis for providing defenses, yet proposals more often fail because of narrower parochial considerations. U.S. coastal defenses during the transition from the technologies of cast-iron guns and wooden ships to steel guns and armored ships (approximately 1870-1900)</p>		

## BLOCK 19

Artillery, Technology/Artillery, History  
 Military History/History, Military  
 Endicott Report/Endicott Board  
 Ordnance, History  
 Fortifications, Coastal  
 Spanish-American War  
 Mahan, Alfred Thayer

## BLOCK 20

provide a case history of providing for U.S. defense, with twentieth century parallels. Publicists and planners quickly recognized the technological obsolescence of pre-Civil War coastal defenses, yet politicians failed to provide funds for improved defenses except when pushed by the threat of war; ultimately, only the coastal vulnerability demonstrated by the Spanish-American War (1898) provided an impetus adequate to cause Congress to fund prudent defenses. Reasons for Congressional lethargy are diverse and complex, but include regional interests, isolationism, party politics, inadequate revenues, competing technological proposals, lack of a palpable threat, and poorly organized lobbying. As a result of the lack of funding, the U.S. Navy had to alter their war plans during the Spanish-American War to defend the U.S. coasts. U.S. defense funding, as here examined, was basically irrational; in many respects it remains so in the 1980's.

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AN ILLUSTRATIVE CASE STUDY FOR TWENTIETH CENTURY  
DEFENSE PLANNERS: THE TECHNOLOGY AND POLITICS  
OF UNITED STATES COASTAL DEFENSE  
1880-1898

by

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Thesis submitted in partial fulfillment of  
the requirements for the degree of  
Master of Arts in the Department  
of History in the Graduate  
School of Duke University

1980

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#### ABBREVIATIONS USED IN FOOTNOTES

Chief of Ordnance Report of [date]: U.S. Ordnance Department. Annual Report of the Chief of Ordnance to the Secretary of War for the Fiscal Year Ended [date]. Washington, D.C.: Government Printing Office.

"Conditions of the Fortifications": U.S. Congress. Senate Documents, vol. 1, No. 3, "Letter From the Secretary of War: Condition of the Fortifications," 47th Cong., 1st sess., 1881. Washington, D.C.: Government Printing Office.

CR: U.S. Congress. Congressional Record. Vol. 1--. Washington, D.C.: Government Printing Office, 1874 to date.

DAB: Dictionary of American Biography. 20 vols. New York: Charles Scribner's Sons, 1937.

"Endicott Report": U.S. Congress. House. The Executive Documents of the House of Representatives, vol. 28, No. 49, "The Report of the Board on Fortifications or Other Defenses," 49th Cong., 1st sess., 1885-86. Washington, D.C.: Government Printing Office.

GPO: Government Printing Office.

Messages and Papers: A Compilation of the Messages and Papers of the Presidents. New York: Bureau of National Literature, 1897.

NCAB: The National Cyclopedica of American Biography. Clifton, New Jersey: James T. White & Co.

NYT: New York Times.

SAL: The Statutes at Large of the United States of America. Washington: Government Printing Office, Semi-annual (cited by volume: page: chapter).

USCAS: United States Coast Artillery School.

USNIP: United States Naval Institute Proceedings.

"The Taft Report": U.S. Congress. Senate. Senate Documents, vol. 5, No. 248, "Coast Defenses of the United States and the Insular Possessions," 59th Cong., 1st sess., 1905-1906. Washington, D.C.: Government Printing Office.

## ACKNOWLEDGEMENTS

The debts I owe to individuals who helped or encouraged me in the preparation of this thesis can never be repaid. Certainly there were many more than I can properly thank in this space; nonetheless, I would like to acknowledge special assistance from several people.

Colonel Thomas E. Griess and Colonel Roy K. Flint of the Department of History at the United States Military Academy made it possible for me to study at Duke University; their support is warmly appreciated.

Four scholars at Duke University have been especially helpful. Professor Richard Watson suggested study of the problem of nineteenth century coastal fortifications before I had any solid idea of a topic; the subject has proved richly rewarding, and Professor Watson's research guidance through the first year of the study was thorough and helpful. Professor I. B. Holley gave me incisive guidance during the second year of research and writing, greatly expanded and focussing the scope of the study. Professor Theodore Ropp provided his penetrating criticism throughout the period. Finally, Professor Calvin Davis read the first draft of the study and assisted by providing otherwise unavailable data on gun mounts.

Professor Edson Armi of the University of North Carolina gave me invaluable criticism from the viewpoint of architectural history.

Throughout the two years, my children, Kate and Daniel, have served as research assistants and have saved me countless hours of tedium. Finally, my wife Jane has been senior research assistant, secretary, critic, and inspiration, sine quo non.

## PLANNING FOR AMERICA'S DEFENSE

How does the United States provide for her defense needs? Put more precisely, does the American system for formulating military policy assure that adequate and prudent measures are taken for the defense of the United States? The importance of this question is obvious, for great nations which have not taken such measures for their defense have historically had a higher probability of being defeated or of suffering inordinate damage in staving off defeat in international conflicts than have nations with more efficient military policies.<sup>1</sup> For purposes of this study, an adequate and prudent defensive military policy is defined as one which has evolved from a rational evaluation of its technological capabilities and those of its possible adversaries, weighed against the international balance of power. Such an analysis should yield a better policy than one derived without such study. Any answer to the question of whether America's method of determining defensive military policy is "adequate and prudent" will be a complex one, and will inescapably depend not only on the parameters that each different analyst chooses to investigate but also on the inevitable biases he brings to the process.

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<sup>1</sup>The emphasis here is on defensive military policies as opposed to the total military strength of a nation, which would include both offensive and defensive components.

This study will construct a paradigm of how defense needs are determined and funded in the twentieth century, based on a variety of interpretations by contemporary analysts. It will then examine the question of how the United States provided for coastal defense in the closing decades of the nineteenth century, searching for parallels and analogues to the twentieth century paradigm. However remote the day and however different the details, the similarities go far to illuminate present day problems in defense with remarkable clarity, justifying an excursion which might at first appear to be an exercise in antiquarianism. The process of funding defense needs has become far more formal and complex in the twentieth century than it was in the nineteenth. To say that the process is more formal is not, however, to say that its basic character is substantially changed. The conflicts between military and domestic spending (i.e. the question of "guns or butter"), the impact of pressure groups and constituencies on legislation, the often parochial desires of the military services, and the difficulties in accurately assessing technological developments and the efficacy of deterrent weapons all have analogues and similarities in the nineteenth century. The problems that nineteenth century Americans had in dealing with these disparate factors point with informative clarity to similar difficulties of present day Americans.

Three separate groups interact in the process of producing a strategy for national defense in the United States: the publicists, the planners, and the politicians. These groups are neither homogenous nor static. Members of the groups may change from one group to another or may be members of more than one group at any given time. The key factor concerning these groups is not the identity of their members, but rather their outlook on defense policy, and how it varies as international and domestic situations change. The tendency of these groups to diverge or converge in their opinions concerning



defense as these situations change and evolve is a critically important factor in how the United States plans for defense.

The publicists include all those individuals and organizations that examine defense needs and recommend courses of action in national defense strategy. The publicists are the most diverse of the three groups. Publicists include elements inside and outside government such as the mass media, "think tanks" which devise defense recommendations, veterans' organizations, industrial and domestic lobbyists, and sometimes members of the executive and legislative branches. Publicists may advocate a strong or a weak defense policy; their rationale may be founded on irrefutably accurate analysis or wild flights of fancy. In this context, the editorialist who recommends a defense policy of massive deterrence and his counterpart who advocates passive acceptance of American defeat anywhere outside the continental United States are both prescribing their solutions to the problem of defense policy.

The publicists have the "national interest" as the foundation of their policies, but their interpretations of the national interest are as diverse as their membership; anti-Communism, strong domestic legislation, healthy defense industries or some crassly self-serving end may be the goal of individually determined national interest. The important point to recognize regarding the publicists as a group is that their policies do not have to meet any concrete standards of rationality or reasoned analysis. Some policies may meet both standards, but they are not necessarily the most influential in the overall process.<sup>2</sup>

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<sup>2</sup>For the range of viewpoints which affect defense decisions, see George C. Gibson, "Congressional Attitudes Toward Defense," [1972] in Richard G. Head and Ervin J. Rokke, American Defense Policy (3d Ed., Baltimore: John Hopkins University Press, [1972]), pp. 358-369, particularly, p. 359.

The planners analyze the overall technological and international situations and translate some of the recommendations of the publicists into concrete proposals for military policy and strategy. As a group, the planners are more likely to use rigid standards of analysis than the publicists. The planners include members of the executive branch and the military services as well as congressional committees. Their proposals as a group are more likely to be rational than those of the publicists, but the proponents vary in their ability to push programs through to become legislation. The military services in particular must hypothesize the "worst case," but the "worst case" may not be a likely event;<sup>3</sup> if they are ineffective in demonstrating the likelihood of the worst case, it is less than likely that their proposals to counter the hypothesis will be funded. Like the publicists, the foundation of the planners is the national interest, but they are more likely to define the national interest in concrete terms. The planners are also likely to view the national interest in terms of their own bureaucracy; they see the international and domestic scenes from the perspective of their own agency or department or congressional committee. They analyze the problem in terms of their group's special interests; it is not surprising that they often interpret benefits for their bureaucracy as being in the national interest. The interests, mission, and capabilities of a given bureaucracy are clues to what its position on a proposal will be.<sup>4</sup> But the planners cannot take action to implement their proposals; that action is reserved for a majority in the Congress, with the advice and consent of the

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<sup>3</sup>Warner R. Schilling, "The Politics of National Defense: Fiscal 1950: in Warner R. Schilling, Paul Y. Hammond, and Glen H. Snyder, Strategy, Politics, and Defense Budgets (New York: Columbia University Press, 1962), p. 146.

<sup>4</sup>Morton H. Halperin, "Why Bureaucrats Play Games," [1971] in Head and Rokke, American Defense Policy, pp. 301-304.

## Executive branch.

The politicians who take action on the planners' proposals are the critical element in the process of determining national defense policy. In The Federalist No. 51 (1788) James Madison envisioned the will of the people as being expressed through the legislature. Nonetheless, the federalist system would protect against legislative abuses by fragmenting the will of the people in both space and time and by requiring a consensus on some policy decisions between the executive and legislative branches. Ambition would be held in check by countering ambitions, and the interests of office holders would be limited by constitutional guarantees of office.<sup>5</sup> Thus the Congress is alleged to express the will of the American people; but it does so in a tortuous and halting manner, subject to a variety of influences.

The factors which serve as parameters influencing Congress and the Executive branch as they decide on America's military policy cover a wide spectrum. The goal of the legislature is the national interest, modified like that of the planners, by their self-interest. But a wide variety of other influences modify a politician's position on national defense. Although no single influence acts alone, an analysis of some of the factors may prove helpful in later analyses of political patterns.

While the national interest is the most overriding consideration influencing Congress and the Executive branch, using national interest to justify action or inaction is much easier than defining it. The national interest can be all things to all men; as we have seen in the case of the publicists,

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<sup>5</sup>Publius [James Madison] The Federalist No. 51: [1788] in The Federalist Papers (New York: New American Library, [1961]), pp. 320-325. For an analysis of the effects of The Federalist No. 51 on the defense planning process, see Edward A. Kolodziej, The Uncommon Defense and Congress, 1945-1963 (n.p.: Ohio State University Press, [1966]), pp. 6-7.

the national interest is a nebulous entity which can be invoked to justify a wide range of action or inaction. In politics, it is probably more often used as a cloak of high-minded rhetoric over political decisions made on realistic and practical grounds.<sup>6</sup> Given the vague and broad nature of national interest as a criterion for measuring Congressional action, more mundane but more concrete gauges yield better tools for analysis.

Most proposals for military policy cost money; given that salient and inescapable fact, monetary implications of a given proposal act as strong influences on the decision-makers. In the matter of appropriations, the Congress can play a negative role in limiting expenditures or a positive role in changing them up or down.<sup>7</sup> It can appropriate funds in excess of what the services request or in excess of the amount the executive branch wants; unless the President vetoes the measure, the services have no recourse except to spend the funds.<sup>8</sup> Many otherwise desirable proposals may never be submitted to Congress because the planners have determined that they are too costly for Congress to pass. Whether this situation is desirable is debatable; the first Chairman of the Joint Chiefs of Staff, General Omar Bradley did not think so: he felt the military responsibility was not to assess what

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<sup>6</sup>Lewis Anthony Dexter, "Congressmen and the Making of Military Policy," in Davis B. Bobrow, ed., Components of Defense Policy (Chicago: Rand McNally & Co., [1965]), p. 95.

<sup>7</sup>Gibson, "Congressional Attitudes," p. 359.

<sup>8</sup>Elias Huzar, The Purse and the Sword: Control of the Army Through Military Appropriations, 1933-1950 (Ithaca, N. Y.: Cornell University Press, [1950]), p. 359. For a recent example, see Andy Plattner, "Conference: 'Just a Good Ole Swap Session'," Army Times, 23 October 1978, p. 16. Among other funds voted in excess of service requests in 1978 were \$13.2 million for World War II vintage machine guns (made in Maine, supported by Maine Senator) and \$33 million for helicopters (made in Washington, supported by Washington Senator) of a type the army did not want.

the economy could or would afford, since only the President and Congress should make that decision, and "certainly in our military recommendations on force we should not be curbed in any way by economic assumptions."<sup>9</sup> Thus the decisions on military spending and therefore on military policy are made not as a part of a wide-ranging assessment of defense needs, but within a narrow range of figures which are politically viable.<sup>10</sup>

Congressmen are by definition politicians; thus it is not surprising that political factors are a strong influence on decisions concerning military policies. This should not be taken as an indictment of politicians, but as a fact of life, for the politician has a test not faced by other members of the process: reelection.<sup>11</sup> To say that every vote of a Congressman is a purely political decision is an exaggeration, but to say that a member's voting pattern reflects the mood of his constituency is a truism in the case of a successful politician. This mood varies over time and is unlikely to support consistently the long terms needs of defense policy.<sup>12</sup>

The effect of a proposed defense policy on a Congressional district is the most direct and inescapable manifestation of a legislator's action reflecting his constituency's desires. As one study expressed the phenomenon, quoting a Congressional staff member speaking of the House Armed Services Committee, who repeated over and over

'Our committee is a real estate committee. Don't forget that. If you study our committee you are studying real estate transactions.' . . .

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<sup>9</sup>Omar N. Bradley, "A Soldier's Farewell," The Saturday Evening Post, 22 August 1953, pp. 63-64, quoted in Schilling, "The Politics of National Defense," p. 253.

<sup>10</sup>Schilling, "The Politics of National Defense," p. 96.

<sup>11</sup>Huzar, The Purse and the Sword, p. 119.

<sup>12</sup>Kolodziej, The Uncommon Defense, p. 442.

[meaning that] . . . the location and related transfer, purchase, and sale of properties is the main concern of the House Armed Services Committee.<sup>13</sup>

Another study has shown a positive statistical correlation between Senate voting patterns and military payrolls in the Senator's home state.<sup>14</sup>

Senators are likely to vote to support specific defense industries in their states whatever their overall views and votes on defense policies may be.<sup>15</sup>

Again, these observations are no indictment of Congress, but a fact: the dispersed power that The Federalist No. 51 extolled requires that individual Congressmen must depend on the approval of their constituents for their continued success.<sup>16</sup>

Pressure groups can be formed to promote or oppose almost any item of defense legislation. Traditional historical pressure groups have included peace movements and preparedness groups before the World Wars, as well as the advocates of domestic spending on social welfare programs in periods of peacetime. Additionally, industrial lobbying groups are traditionally effective in promoting defense policies when they stand to gain from the contracts involved. The largesse in rewarding cooperative Congressmen need not be improper, as in the case of locating defense plants in districts in return for the legislative assistance; obviously relocating plants out of areas where Congressional support is lacking has a corresponding effect in

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<sup>13</sup>Dexter, "Congressmen and the Making of Military Policy," p. 100. Emphasis in original. Also see Huzar, The Purse and the Sword, pp. 49-51.

<sup>14</sup>Bruce M. Russett, What Price Vigilance? The Burdens of National Defense (New Haven: Yale University Press, 1970), pp. 72-73.

<sup>15</sup>Ibid., p. 84; also Plattner, "Conference: 'Just a Good Ole Swap Session'."

<sup>16</sup>Russett, What Price Vigilance?, p. 186.

punishing a recalcitrant politician.<sup>17</sup>

A member of Congress may have personal interest in a given question, and the personal interest may be based on any sort of motives from nostalgia and patriotism to wealth and self-aggrandizement. Congressmen are human beings and subject to the same human strengths and foibles as the rest of their race. Thus if a Congressman has served in a branch of military service, particularly in a war, he is likely to preserve feelings that will affect his voting on questions of defense in later years. A Congressman may back measures which are virtually unarguably in the national interest, but which will incidentally benefit or enrich him personally.<sup>18</sup> These factors, however, are not likely to follow a predictable pattern and are not particularly useful in our analysis.

The planners may present their proposals to Congress in a way that prejudices their chances of approval from the start. Much of the receptiveness of politicians toward defense projects varies with the reputation of the military service for reliability and accuracy within its various departments, while the personalities of the officers who represent the services before Congress plays a role also.<sup>19</sup> Interservice rivalries may heighten problems in getting legislation through Congress. When the military services

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<sup>17</sup>For recent examples of the effects of industrial lobbying for defense industries, see the polemics in Drew Pearson, The Case Against Congress: A Compelling Indictment of Corruption on Capitol Hill (New York: Simon and Schuster, [1968]), pp. 339-348.

<sup>18</sup>*Ibid.*, also see the list of ten Congressmen whose financial foibles from 1976 to 1979 included bribes, conflict of interest, kickbacks, and improper donations in "Rogues' Gallery," Time, 18 February 1980, p. 19.

<sup>19</sup>Nelson W. Polsby, Congress and the Presidency, 3d Ed. (Englewood Cliffs, N. J.: Prentice-Hall, Inc., [1961]), p. 174, and Huzar, The Purse and the Sword, p. 118.

fail to present a united front, or when they take positions opposed to congressional guidance, chances for their proposed legislation understandably suffer.<sup>20</sup> But the critical factor in determining military policy is beyond the influence of the planners: the international and domestic milieu.

The foreign policy of the United States is a product of as many factors as the military policy, and is determined by many of the same pressures. But a paramount consideration in deciding on both is the international situation. Both the President and Congress must agree in principle on defense policies for them to be proposed, funded, and approved.<sup>21</sup> Because of this strong consensus requirement, the international situation is a critical element in moving the President and Congress toward changes in defense policies. Except in response to a dramatically changed international situation, national defense policy making is usually government by committee: a laborious process characterized by generalities, compromise, lack of unity, and magnified difficulties.<sup>22</sup> This policy-making apparatus moves slowly without an external threat of dramatic dimensions; it is particularly unresponsive to a number of incremental changes in the international military

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<sup>20</sup>A recent example of both interservice rivalry and the military taking a course against the guidance of Congress is the attempt to consolidate helicopter flight training for the three services at Ft. Rucker, Alabama. Although the measure would save an estimated \$100 million over five years, the move was opposed by the Navy and Florida Congressmen in the Fiscal Year (FY) 78 and 79 budget debate. In 1979 the Defense Department (DOD) was told to cancel the plan, but in the proposed FY 80 budget, DOD underfunded the Navy helicopter flight training program in an effort to force the Navy into de facto compliance for lack of funds. Congressional reaction was swift and blunt; as one Senate aide put it, "This sure as hell isn't what we expected . . . The Pentagon is really dumb. They got their ass kicked over this last year. This is unforgiveable. This is just a backdoor consolidation attempt." Andy Plattner, "Defense Risks a Battle Over Chopper Training," Army Times, 18 February 1980, p. 26.

<sup>21</sup>Kolodziej, The Uncommon Defense, pp. 8-9.

<sup>22</sup>Samuel P. Huntington, "Strategic Planning and the Political Process," in Bobrow, Components of Defense Policy, p. 81.



balance which may total to cause quantum change in the balance. The national defense policies, however, tend to continue basically unchanged until a dramatic and palpable threat arises which can mobilize the President, Congress, and the American people to action. Obviously, this results in crisis-oriented diplomacy; it also accounts for the traditional fluctuations of American military strength between times of peace and war.<sup>23</sup> How the President interprets and conveys this threat is crucial to what the Congressional and public reaction will be. Traditionally, the President has the ability to exaggerate a minor threat or soft-pedal a more imposing one; the public and Congress will tend to follow his lead.<sup>24</sup>

"Public opinion" is, to a large extent, both a product of and a determiner of foreign and military policy. It is probably the greatest force in shaping military policy, since attitudes on defense reflect attitudes on foreign policy in general. The image Americans hold of their country as a world power determines the degree of their approval of a strong military force. This was reflected in the American mood of isolationism in the 1920's and in the "win the war" mood of the 1940's: both attitudes were significant shapers of military policy. More recently, the Gallup Poll reflected a dramatic increase in bias against military spending during the Vietnam War in the 1960's.<sup>25</sup> But public opinion has many weaknesses as a formative

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<sup>23</sup>Samuel P. Huntington, The Common Defense: Strategic Programs in National Politics (New York: Columbia University Press, 1961), p. 200; Schilling, "The Politics of National Defense," pp. 7-8, 26, 220.

<sup>24</sup>Huntington, The Common Defense, p. 199; Gibson, "Congressional Attitudes Toward Defense," p. 368.

<sup>25</sup>Adam Yarmolinsky, The Military Establishment: Its Impacts on American Society (New York: Harper & Row, [1971]), p. 93; Gibson, "Congressional Attitudes Toward Defense," pp. 360, 267.

force in military policy. First, it is easier for public debate to come to grips with simple decisions, not complex strategic problems.<sup>26</sup> Second, it is mercurial in nature, changing overnight in response to dramatic events.<sup>27</sup> Third, its response is an emotional one, not an intellectual one; such a response is naturally subject to overaction.<sup>28</sup> Finally, it is indeterminate: what "public opinion" is on a given subject at a given time is very difficult to measure, either at the moment or in historical research. Public opinion is by nature personal and subjective, but it is formed in part by the mass media, particularly the "elite press," and by public figures in the Executive Branch and in Congress. Although imperfect, these sources can be analyzed as a gauge of public opinion.<sup>29</sup> Even though national public opinion may be difficult to measure, a successful congressman usually has little difficulty in determining the public opinion of his constituency, and it is critical to his personal decision on a given measure.

Measures can be carried from conception to appropriation only by a process of consensus building in Congress. Given the disparate and divergent nature of the pressures on Congress outlined above, this is a monumental and often insurmountable task. The advocate of a military policy, like the advocates of foreign policies or domestic policies, must build a consensus for his measure in the political arena; without this consensus, the measure will fail no matter what its merits.<sup>30</sup> The deathbed for most proposed

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<sup>26</sup>Huntington, The Common Defense, p. 177.

<sup>27</sup>Paul Y. Hammond, "NSC 68: Prologue to Rearmament" in Schilling, Strategy, Politics, and Defense Budgets, p. 377.

<sup>28</sup>Schilling, "The Politics of National Defense," p. 27.

<sup>29</sup>Ibid., pp. 98-99.

<sup>30</sup>Huntington, "Strategic Planning," p. 85; Schilling, "The Politics of National Defense," p. 20, quoting Roger Hilsman, "The Foreign Policy Consensus: An Interim Report," in Conflict Resolution, December 1959, pp. 361-382.

measures is the Congressional committee; once in committee, a bill must be nurtured by strong political advocates or it will never emerge.<sup>31</sup> Without a dramatic foreign challenge to spur action, the greatest threat to a proposed military policy is usually domestic politics; as one analyst stated the dichotomy, "competition between the external goals of government as a collective entity in a world of other governments and the domestic goals of the government and other groups in Society is the heart of military policy."<sup>33</sup> The tendency is thus away from rather than toward consensus on military policy in peacetime. Alexis de Tocqueville, the sage nineteenth century observer of the American scene, expressed reservations about the effect of this feature of politics on the United States as a world power, when he said that democracy appeared "better adapted for the conduct of society in times of peace, or for a sudden effort of remarkable vigor than for the prolonged endurance of the great storms that beset the political existence of nations. . . ."34

Given the multiple tendencies against consensus-building among the decision-makers it is not surprising that certain observable biases develop favoring some types of legislation over others. Because of the relatively short terms of office with relation to long range programs which may require years or decades to show results, the Executive Branch is more likely to propose, and Congress more likely to pass, measures that can be completed quickly. Additionally, given the requirement for a fairly high degree of

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<sup>31</sup>Polsby, Congress and the Presidency, p. 153.

<sup>32</sup>Huntington, The Common Defense, p. x.

<sup>33</sup>*Ibid.*, p. 3.

<sup>34</sup>Alexis de Tocqueville, Democracy in America, [1835], vol. I, p. 237, quoted in Kolodziej, The Uncommon Defense, p. 443.

public support for Congressional actions, the bias is in favor of situations which are perceived as acute and against those which are perceived as chronic or long term.<sup>35</sup> In other words, a crisis-orientation is part of the American system of government in most cases.

Building a consensus is easier in some cases than others. One analyst has catalogued six important parameters within which Congress decides on appropriations. First, Congress considers the amount the given agency or department received in the preceding year. That is, the appropriation in a succeeding year is likely to be a little larger or a little smaller than previous appropriations, but not markedly so in most cases. Second, world developments as perceived and interpreted by Congress and the Executive branch particularly influence foreign and military policy. Third, the agency or departmental reputation for hard work, accuracy, and reliability are taken into account. Fourth, prior program commitments are considered; Congress is less likely to terminate a long-term program that is moving toward completion. Fifth, lobbyists and interest group demands for or against a measure are important. Finally, the general economic situation in the country has a profound effect on measures concerning appropriations.<sup>36</sup>

When proposals for new military policies concern unproved technology, special problems arise. New or innovative technology usually concerns a new weapon which is thought to be more efficient at performing a role the military already performs. It is often advanced by a zealous officer who enlists support horizontally among his fellow officers, then vertically from higher ranking officers within his service and from outside the service as

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<sup>35</sup>Polsby, Congress and the Presidency, p. 6.

<sup>36</sup>*Ibid.*, p. 174.

support becomes necessary.<sup>37</sup> Other channels for technological innovation are the research and development efforts of the services and solicited or unsolicited proposals from industry for the improvement of weapons from industry. Given the lobbying capabilities of industry and the military services' own means of promoting legislation, the industrial efforts are more likely to achieve success. Nonetheless, short of war, there is no sure means of insuring that a given technological innovation or theory of defense will markedly contribute to success.<sup>38</sup>

If proposed technological innovations are to fill the role of a deterrent, the problem of analyzing its efficacy is compounded. When a weapon is expected to fill a deterrent role, it must really fill two roles, both deterrence and defense. That is, the deterrent role acts against an enemy's intentions to attack, while the defensive role must come into play if the deterrent role fails: the weapon must be effective as a weapon against the enemy.<sup>39</sup> Thus the difficulty in assessing the weapon is compounded; it must be weighed concerning its effectiveness in deterring an external threat and concerning its effectiveness when used per se.<sup>40</sup>

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<sup>37</sup>Vincent Davis, "The Politics of Innovation: Patterns in Navy Cases," [1966], in Head and Rokke, American Defense Policy, pp. 402-405.

<sup>38</sup>Schilling, "The Politics of National Defense," p. 226; for problems of assessing technological efficacy of new weapons, see S. J. Dudzinsky, Jr. and James Digby, "New Technology and Control of Conventional Arms: Some Common Ground," International Security, vol. 1, no. 4 (Spring 1977), pp. 143-159, particularly pp. 149-151, and Elmo R. Zumwalt, "An Assessment of the Bomber-Cruise Missile Controversy," Ibid., vol. 2, no. 1 (Summer 1977), pp. 47-58, and [Francis P. Hoerber, Alton H. Quanbeck, and Archie L. Wood], "Correspondence: Debating the B-1 Bomber," Ibid., vol. 1, no. 4 (Spring 1977), pp. 163-169, among others in this journal.

<sup>39</sup>Huntington, The Common Defense, pp. 203-204.

<sup>40</sup>Glen H. Snyder, "Deterrence and Defense: A Theoretical Introduction," [1961], in Head and Rokke, American Defense Policy, pp. 99-100.

Because of the uncertainties concerning possible enemy intentions, the general complexity of new technology, and the difficulties inherent in conceptualizing changing parameters, such abstruse evaluations are unlikely to be made in a timely manner.

Throughout the political process of determining military policy, a basic irrationality is at work; policies tend to continue after their efficacy has passed or is at least questioned, while new policies are not adopted to deal with changing circumstances. The irrationality occurs in part because of the complexity of the system. Military policy exists only to support and complement the nation's foreign policy, but exactly what is the nation's foreign policy at any specific time? Alternate means of defense exist, but which is best? The nation's foreign relations change almost daily; what will they be when a proposed military policy comes into existence? The defensive military policies must be determined in advance, but how can that determination be made? Divergent demands are competing for the nation's economic resources, but how can the best allocation be made? Multiple answers, even multiple "correct" answers can be made to each question at any given time; therefore a problem of choice will always exist. This problem of choice can only be determined in the arena of politics, thus the defense budget will always be a political problem with a political solution.<sup>41</sup> As one analyst observed, "Military policy is always the product of politics. Good military policy is only the product of brave choice and ingenious compromise by experienced politicians."<sup>42</sup>

In such an important matter as the national defense, one would hope

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<sup>41</sup>Schilling, "The Politics of National Defense," pp. 11-15, 214.

<sup>42</sup>Huntington, The Common Defense, p. xii. (Emphasis in original.)

that experienced politicians would carefully analyze the international and domestic situations and make rational choices and compromises to provide for American security. But Congress is not so organized as to encourage the examination of all parameters which come together to make defense policy. No single committee can look at strategic needs, the military threat, budget demands, domestic needs and taxation, and weigh them for a solution. Thus the final decision is always ex parte: it may be a good decision or it may not, for there is no mechanism to insure rationality.<sup>43</sup>

This, then, is the nature of the process of determining military policy in the closing decades of the twentieth century: decisions on military policy are inescapably based on real political considerations. They are in the first analysis, political decisions, often marked by irrationality. Dramatic changes in military policy can almost never be taken except in response to dramatic changes in international affairs.

By looking back to an earlier period when the problems of national defense were less complex, it may be possible to identify and isolate for critical analysis those factors which constitute the enduring essentials of the defense equation. The problem of how best to defend the coastlines of the United States in the late nineteenth century provides an example of problems in military policy with modern parallels. Most of the difficulties of providing for defense needs late in the twentieth century had their analogues in the question of coastal defense. The publicists, planners, and politicians of both periods grappled with new and rapidly developing technologies in which quick obsolescence was an important factor. In the nineteenth century, decisions on measures for coastal armament had to be

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<sup>43</sup>Huntington, "Strategic Planning and Political Process," p. 82.

made years in advance of the use of the weapons, because of the time required for their construction. Since these decisions were made to counter the actions of foreign powers, they had to be made from an analysis of what the foreign policy of the United States would be years in the future, not at the time of the funding. Publicists of the period recommended a variety of solutions. Planners translated some of these recommendations into a wide spectrum of proposals for Congressional action. Finally, the politicians supporting coastal defense tried to form a coalition of widely disparate interests which could agree on proposed measures. The process was involved and time-consuming; its study provides interesting and illuminating parallels for the modern defense planner.



## THE CONFIDENT ISOLATION OF AMERICA, 1865-1890

The dominant feature of international relations during the third quarter of the nineteenth century had been the numerous national and international conflicts in Europe and America. Following the mid-century revolutions throughout Europe, a period of instability ensued which saw countries warring in dozens of conflicts until the 1870's. The Great Powers were forced to spend huge resources on armies and armaments.<sup>1</sup> In the United States, tensions concerning sectional rivalries, industrialization, and slavery had erupted in an internecine war that had exhausted the country and its resources.

As the decade of the 1880's opened, the world seemed more stable. Europe was at peace, albeit an uneasy one, as systems of alliance by Bismarck and others took form. The Great Powers all seemed more interested in dominating faraway colonies than in further wars on the continent.<sup>2</sup> In the United States, the period of Reconstruction ended, and a mood of confidence and optimism began to predominate following the shoddy politics of post-war

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<sup>1</sup>For a study of European wars of the period, see A. J. P. Taylor, The Struggle for Mastery in Europe, 1848-1914 (Oxford: Oxford University Press, [1954]), pp. 24-219 passim. A comparison of spending by Great Powers on defense is given on page xxviii.

<sup>2</sup>Ibid., pp. 286-394 passim.

administrations.<sup>3</sup>

The political scandals of the Grant administration had rocked the country and their legacy of distrust of politics would remain with the citizens for decades. Political morality had declined sharply under Grant, and although it began to rise by 1880, the rest of the century would be required for politics to recover the respect of the country.<sup>4</sup>

A mood of laissez-faire liberalism pervaded the country. Social Darwinism in its pacifist form of economic competition and survival of the fittest prevailed, along with an optimistic faith in human nature, reason, and progress.<sup>5</sup> Most Americans felt that the United States could live with other countries under the same principles.

The foreign policy of the nation was very nearly the absence of a foreign policy much of the time; but the economic forces that would bring about the extra-continental expansion later in the century were already at work. The expansion did not begin suddenly, but was a natural evolution of the settlement of the North American continent. About the time of the Civil War, the character of expansion changed from searching for frontier lands to searching for markets on and off the continent. Both businessman and politician only poorly understood that such an economic expansion would bring an increased need for protection of commerce. Even less did they appreciate the political and military price of such expansion: international political

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<sup>3</sup>Leonard D. White and Jean Schneider, The Republican Era, 1869-1901: A Study in Administrative History (New York: MacMillan Co., 1958), pp. 14-15, and Editors of American Heritage, The Confident Years (New York: American Heritage Publishing Co., 1969), p. 7.

<sup>4</sup>White and Schneider, The Republican Era, pp. 9-10, 13.

<sup>5</sup>Ibid., p. 3, and Samuel P. Huntington, The Soldier and the State: The Theory and Politics of Civil-Military Relations (Cambridge: Belknap Press, Harvard, 1959), pp. 223-224.

entanglements and a reinvigorated Monroe Doctrine, which would require military forces to make it credible.<sup>6</sup> Without such an appreciation, and given the faith of the period in rational human nature, it is not surprising that a strong military force was not an important goal of the era.

A country without perceived imperialist goals and with oceans as barriers to foreign encroachment had little use for an efficient military establishment. The Army's role in America was restricted to fighting Indians on the ever-decreasing frontier while the Navy had become a collection of Civil War antiques with a limited mission of protecting American commerce. The period was one of equilibrium, particularly for the Army. It was maintained after 1869 with twenty-five regiments of infantry, ten of cavalry, and five of artillery, with twenty-five to twenty-eight thousand men dispersed at 255 posts in the United States and its territories. Partly because it was so small, it received little public support, for the Army had little public exposure and offered only meager opportunities for political patronage.<sup>7</sup>

To the average citizen, the military seemed a misfit in American society in an era of enlightenment, a negative influence which lived off the producers of the nation. International law and arbitration would limit and solve future international conflicts, making wars anachronisms of earlier ages. Since an era of unending peace was almost certainly at hand, war was

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<sup>6</sup>Walter LaFeber, The New Empire: An Interpretation of American Expansion, 1860-1898 (Ithaca, N. Y.: Cornell University Press, [1963]), pp. vii, 1-3.

<sup>7</sup>Russell F. Weigley, History of the United States Army (New York: MacMillan, [1967]), p. 167, and Huntington, The Common Defense: Strategic Programs in Defense Politics (New York: Columbia University Press, 1961), p. 9.

an evil manifestation of wasteful militarism. The military services were non-productive parasites on the economy. Military institutions and military preparations, many believed should be eliminated, except for forces on the frontier to control the Indians, and a small Navy. Thus society separated the military from itself bringing about a mutual indifference, sometimes even hostility between the civilian and military sectors of America.<sup>8</sup> As Presidents used the Army to control or break over three hundred labor disputes, the alienation continued and the separation of the military from society deepened.<sup>9</sup>

An additional factor militating against a large defense establishment was the comparatively recent national experience of the Civil War. Many if not most families had members who had fought as citizen-soldiers in that war, and their predominant conviction was that the war had been won by the non-professionals, not by the regulars. This constituted a strong argument against the advocates of larger military forces, such as Emory Upton, who tried to impose an army along Prussian lines on the American system. Such efforts were foredoomed to failure, given the temper of the time and probably diverted attention from more realistic recommendations.<sup>10</sup>

Without support of the citizenry, it would be difficult for Congress to be pushed to form a consensus for increased defense appropriations. Few forces other than the constituency of the individual legislator were at work to influence such spending. There was no credible foreign threat to

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<sup>8</sup>Huntington, The Soldier and the State, pp. 223-227, also Theodore A Dodge, "The Needs of Our Army and Navy," Forum 12 (October 1891): 247-248.

<sup>9</sup>Weigley, History of the United States Army, pp. 281-282.

<sup>10</sup>Ibid., pp. 276-281.

the United States.<sup>11</sup> There was virtually no industrial lobbying effort, since neither the Army nor the Navy were significant consumers of industrial products before 1881.<sup>12</sup> Congress reflected the distrust and hostility of the populace toward all things military.<sup>13</sup> Constitutents always preferred spending for local projects, such as river and harbor improvements, to appropriating funds for a distant defense against some future enemy, and their representatives respected the preference.<sup>14</sup> As one study succinctly described the situation, "The country was content in isolation and unwilling to spend money for an army and a navy without an urgent mission;" instead, congressional military policy "was to support an army at the minimum strength to fulfill its minimum mission."<sup>15</sup>

Of all proposed defense measures of the period, probably few had a smaller existing consensus for passage in Congress than coast defense. Some legislators felt that the navy provided the best defense, or that the nation needed no defenses because the country was at peace.<sup>15</sup> Others felt that the country did not need to spend for defenses since they could be built when

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<sup>11</sup>Walter Millis, Arms and Men: A Study in American Military History (New York: Putnam, 1956), pp. 151-152.

<sup>12</sup>Huntington, The Soldier and the State, p. 227.

<sup>13</sup>White and Schneider, The Republican Era, p. 134.

<sup>14</sup>W. Stull Holt, The Office of the Chief of Engineers of the Army: Its Non-Military History, Activities, and Organization (Baltimore: Johns Hopkins Press, 1923), p. 15, and NYT, 25 January 1882 (Editorial), p. 4, and 15 April 1891 (Editorial), p. 4.

<sup>15</sup>White and Schneider, The Republican Era, p. 134.

<sup>16</sup>NYT, 13 March 1880, p. 1. In Senate debate, Senator Eli Salisbury (R/Del.) alleged that the best seacoast defense was the Navy; other coastal Senators thought that the proposed bill to maintain small expenditures for maintenance of existing fortifications was "utterly inadequate." Some felt U.S. investments in Mexico or Isthmian canal problems could bring war, while most apparently felt war was out of the question. The same themes and diversity of opinion recur repeatedly in debates; see, for example, NYT, 1 July 1884, p. 1, 4 June 1891, p. 5, or Representative Forney's remarks, 17 July 1886, 49th Cong., 1st Sess. Congressional Record (17: 7097).

war came.<sup>17</sup> Additionally the sectional aspect of the question is an important one which differentiated congressional support for an expanded navy from the lack of support for coastal defenses. Most coastal Senators and Representatives supported fortifications fairly consistently, but while the coastal Senators comprised a narrow majority in that chamber throughout the period, the coastal Representatives were always a small minority in the House. Congressmen and their constituencies saw the question of fortifications as a regional one, since spending for fortifications would occur only in districts with large harbors. On the other hand, they saw the naval question as a national one, since spending would be more widely distributed over a number of districts;<sup>18</sup> additionally, the national prestige of a large Navy was a factor, while little or no national prestige accrued from improved coast defenses.<sup>19</sup>

Nonetheless, it would be an oversimplification to place all of the blame for lack of positive action in providing coastal defenses on Congress and its constituencies. In the absence of an existing consensus on any measure, proponents of that measure must build a consensus for themselves; in this regard, proponents of strong coast defenses failed miserably. Army policy itself was undirected and marked by a series of undistinguished Secretaries of War until the appointment of Elihu Root in 1899.<sup>20</sup> Relations

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<sup>17</sup>See Representative William Holman's remarks, 1 April 1890, 51st Cong., 1st Sess., Congressional Record (21: 2887).

<sup>18</sup>Frank Heath, Jr., "United States Coast Defences," The Peterson Magazine 6 (August 1896): 774.

<sup>19</sup>Dodge, "The Needs of Our Army and Navy," pp. 258-259.

<sup>20</sup>White and Schneider, The Republican Era, p. 139, and Weigley, History of the United States Army, pp. 285, 312.

between the Secretary of War and the Commanding General of the Army wavered between grudging cooperation and open opposition.<sup>21</sup> Without centralized guidance the various bureaus and departments took their own courses; with neither adequate financial support nor public interest and lacking either purpose or policy guidance, they tended to deteriorate or to become the private fiefs of their leaders.<sup>22</sup> The Presidents took little opportunity to influence legislation except in their Annual Messages.<sup>23</sup> Thus, with a lack of leadership from the Executive Branch and no centralized guidance of the staff bureaus, appropriations bills became battles between Congress and the bureau or department heads. By default, congressional committees became involved in minute details that other administrative organizations could have handled better. They passed bills specifying exact amounts to be spent on various projects yet without adequate study or expertise to determine how much money could be spent efficiently. The often arbitrary spending restrictions tended to hamper the already inefficient administration of the bureaus and departments.<sup>24</sup> In 1879, a contemporary observer and participant, Senator George F. Hoar, commented on the misguided role of Congress, saying that Congress had "no responsibility for giving due attention to important measures [and] no authority to decide between conflicting claims."<sup>25</sup>

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<sup>21</sup>Weigley, History of the United States Army, pp. 285-290.

<sup>22</sup>White and Schneider, The Republican Era, pp. 134, 137, 144.

<sup>23</sup>*Ibid.*, p. 98.

<sup>24</sup>*Ibid.*, pp. 45, 47, 54.

<sup>25</sup>George F. Hoar, "The Conduct of Business in Congress," North American Review 128 (1879): 133-134; James A. Garfield agreed in "National Appropriations and Misappropriations," *ibid.*, pp. 572-586; both cited in White and Schneider, The Republican Era, p. 49.

Given the ineffectual character of institutional arrangements which characterized the process in which Congress decided on measures for defense of the United States, it becomes necessary to examine an intermediate question before looking at the process of funding for coast defense: what weapons would make up the minimum adequate and prudent measures for defense of the coastline of the United States as the nineteenth century drew to a close? An appreciation of the technological changes in the capabilities of artillery which occurred after mid-century are critical in arriving at an answer.



## THE REVOLUTION IN COAST ARTILLERY

A revolution in cannon weapons had occurred during the mid-nineteenth century; a revolution so profound that it has been accurately described as the most fundamental change to occur in artillery between the first use of gunpowder in antiquity and the invention of the atomic projectile in the mid-twentieth century.<sup>1</sup> Beginning about 1870, a series of technological changes came together to make the cannon of 1900 an entirely different weapon than that of 1850. An understanding of some of the technological changes is critical to an appreciation of the difficulty which both the military and the politicians of the period experienced in determining the direction in which coastal defenses should be improved. If the improvements had been the result of a single innovation, they would be considerably easier to understand; they were, however, the combined effect of a number of individually minor improvements in the production of steel, the design of cannon, and the composition of powder. The cumulative effect of these changes produced a quantum-jump in the state of the art of artillery. Changes of this magnitude were difficult to comprehend at the time they were

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<sup>1</sup>Emanuel Raymond Lewis, Seacoast Fortifications of the United States: An Introductory History (Washington, D. C.: Smithsonian Institution Press, 1970), p. 76; also see John E. Greer, "Recent Developments in Gunmaking," The Cosmopolitan, 8 (December 1889): 395.

occurring, and it is perhaps not surprising that there was dispute as to their importance among contemporaries.

In 1850 cannon throughout the world were constructed primarily of cast iron or bronze with smooth (unrifled) bores; they were muzzle-loading and shot a round projectile when a quantity of black powder exploded in the confined space behind the ball.<sup>2</sup> (Figure 1 depicts comparative design features of cast-iron and steel rifles of the period.) In size, they were usually standardized among empirical rather than scientific lines at approximately eighteen calibers (i.e., barrel length was eighteen times the bore diameter) although other ratios were common.<sup>3</sup> Many experiments had been made in every facet of design of the cannon and projectiles in efforts to increase range, accuracy, and lethality, but the inherent limitations of the components were such that many of the experiments were failures.<sup>4</sup>

One of the principal limitations was the cast iron of which the guns were constructed. Cast iron varies in purity of composition and has a much lower tensile strength and elastic limit than either steel or wrought iron. Successive firing of cast or wrought-iron guns progressively and cumulatively weakens them, making reliability uncertain at any given firing.<sup>5</sup> Spectacular accidents, such as the one which killed Secretary of State Abel P. Upshur<sup>6</sup>

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<sup>2</sup>Joseph Jobe, Guns, An Illustrated History of Artillery (New York: Crescent Books, 1971), p. 127 ff.

<sup>3</sup>Ibid., pp. 67-70.

<sup>4</sup>Ibid., pp. 128-39.

<sup>5</sup>W. Le Conte Stevens, "Evolution of the Modern Heavy Gun," Appletons' Popular Science Monthly 51 (June 1897): 150-53.

<sup>6</sup>Robert H. Ferrell, American Diplomacy: A History (New York: W. W. Norton & Company, 1975), pp. 311-12, and Bernard and Fawn M. Brodie, From Crossbow to H-Bomb (Bloomington, Indiana: Indiana University Press, 1973), p. 140.

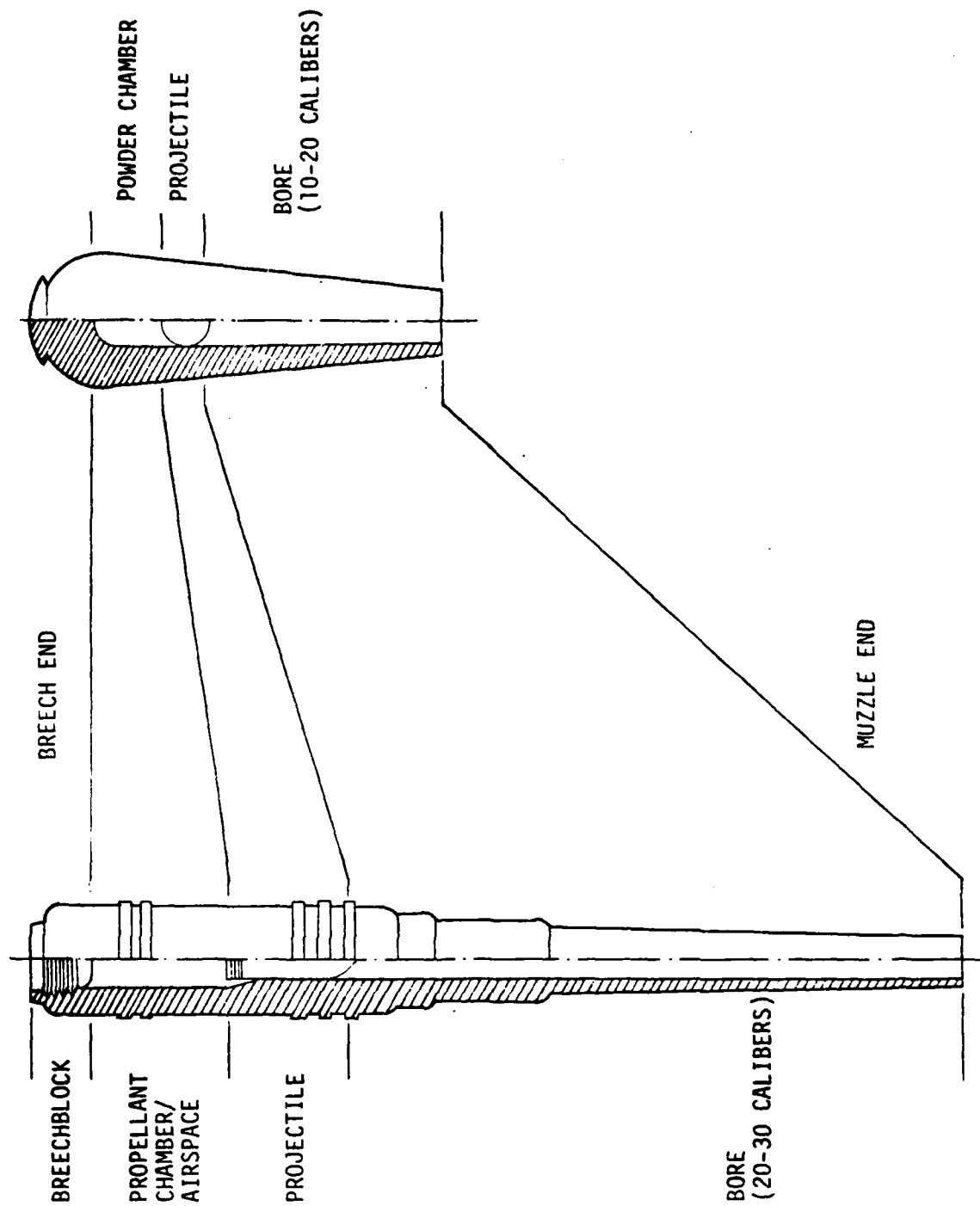


FIGURE 1

Comparison of Muzzle-Loading and Breech-Loading  
 Ordnance of Same Caliber, 1886  
 Adapted from Plates accompanying Endicott Report

in 1844 when he and President Tyler were aboard the Princeton to observe trials, were not uncommon. In an attempt to overcome some of the limitations of the material in the 1850's, Thomas J. Rodman of the United States Ordnance Department developed a method of hollow casting the iron and cooling it from the inside so that the gun was under stress from the outside and thus, although still not completely reliable, guns of this design were better able to withstand the explosive forces of firing.<sup>7</sup> About the same time, John A. B. Dahlgren of the United States Navy modified the shape of the cannon, thickening it around the chamber and tapering to the muzzle, giving it the characteristic "champagne bottle" shape of Civil War naval guns.<sup>8</sup> These innovations took the cast-iron cannon to the limits of its potential, the largest gun cast being a twenty-inch cannon firing a ball weighing over a half a ton.<sup>9</sup>

Although far from being as efficient as later steel guns, the muzzle-loading smooth bores were adequate for the needs of the period. The battering effect of a heavy, low velocity cannon ball shook the wooden war ships and loosened their structural components. This "racking" effect damaged the ships more than the penetrating effect of more efficient later guns would have. The development of steel, however, was at the same time the cause for and one of the means of innovation in design. When wooden navies gave way successively to steam-powered armored ships of iron, wrought iron, and then steel during the second half of the century, the smashing

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<sup>7</sup>Stevens, "Evolution of the Modern Heavy Gun," p. 141, and C. F. Goodrich, "Our New Naval Guns," The Century Magazine 40 (September 1890): 669, and Jobe, Guns, p. 144.

<sup>8</sup>Stevens, "Evolution of the Modern Heavy Gun," p. 151.

<sup>9</sup>Captain John E. Greer, "Recent Developments in Gun-making," The Cosmopolitan 8 (December 1889): 396.

effect of the cannon balls no longer caused significant damage. Thus the development of a penetrating explosive projectile became necessary.<sup>10</sup> Penetrating power is a function of momentum, which is itself the product of the weight (or mass) of the projectile and the square of its velocity; an increase in velocity will thus increase the penetrating power much more, proportionately, than an increase in weight. Up to a point, this increase in velocity could be produced by simply increasing the powder charge, but this approach necessitated an increase in the chamber volume to accommodate the charge. The amount of explosive force the cannon could sustain was finite, however, so that a better solution than simply a larger explosive charge was to keep the projectile under the influence of a lower propelling force for a longer time. In this way, more propelling force could be transmitted to the projectile before it left the muzzle.

Two developments were required before a propelling force could be exerted on a projectile for a longer time. First it was necessary to design a propelling charge which would burn rather than explode; and second, the gun barrel must be proportionately longer. Slow-burning propellants required a fundamental change in the nature of gunpowder.<sup>11</sup> Improvements in propellants were made throughout the decade of the 1830's. During this time, several innovations served to slow the explosive force of the powder. First, the propellant was manufactured in large prism-like shapes resembling flat hexagonal machinist's nuts thus limiting the surface area available for burning; since speed of burning is a function of surface area of the solid,

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<sup>10</sup>Brodie, From Crossbow to H-Bomb, pp. 158 ff.

<sup>11</sup>Greer, "Recent Developments in Gun-making," p. 398, and "Modern Artillery," Van Nostrand's Engineering Magazine 27 (October 1882): 296-97.

this was a mechanical, rather than chemical solution to the problem.<sup>12</sup> Later, new powders of chemical composition were developed in Germany, then copied in the United States by DuPont: these powders produced lower, but more sustained pressures throughout the firing sequence. By 1890, the British had developed cordite, soon to become a world-wide standard propellant. To keep the projectile under the influence of the slower burning propellant for a longer time, designers progressively increased the barrel length relative to the diameter until they attained optimum theoretical results. Gun designs were standardized between twenty-five and forty calibers (i.e. length of bore expressed in diameters of bore).<sup>13</sup>

Another important development in cannon technology to achieve wide acceptance during the second half of the nineteenth century was the rifled bore, although the Italians had first successfully employed it in cannon as early as 1846. The full effectiveness of rifling came with the steel guns.<sup>14</sup> Rifling was one of the factors in changing from the round cannon-ball to the familiar elongated "bullet-shaped" projectile and from the muzzle-loading to the breech-loading weapon.<sup>15</sup> Rifling considerably increased accuracy and range by imparting a stabilizing spin to the projectile, and designers employed it as an interim measure in improving the performance of

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<sup>12</sup>An interesting note on technology is that the same method of limiting burning speed by limiting surface area was used in the solid fuel rockets of the early 1960's; they also used hexagonally cast rods of fuel.

<sup>13</sup>Greer, "Recent Developments in Gun-making," p. 400, and "The Defense of Our Sea-Ports," Harper's New Monthly Magazine 71 (November 1885): 932, and Goodrich, "Our New Naval Guns," p. 663-69.

<sup>14</sup>Brodie, From Crossbow to H-Bomb, p. 139.

<sup>15</sup>Goodrich, "Our New Naval Guns," p. 667.

smooth-bore cannon in the United States when the Ordnance Department converted a number of the outdated Rodman ten-inch Civil War cannon to eight-inch rifled guns as late as the 1890's by inserting a wrought iron rifled sleeve into their bores.<sup>16</sup>

Perhaps the greatest dispute over gun design was over the question of muzzle or breech-loading (i.e. loading from in front of or from behind the gun). Designers had employed breech-loading to some extent earlier to protect the gun crews since breechloaders avoided exposing the crew during reloading operations as muzzleloaders did. When the Rodman proved his method of casting heavy ordnance to be feasible in 1869, prospective breech-loading designs had been largely abandoned because of difficulties encountered in solving the rearward obturation problem, that is, the sealing of the breech tightly enough to preclude escape of the expanding gasses to the rear through the breech mechanism during firing.<sup>17</sup>

Rearward obturation caused much of the controversy over breech-loading. The longitudinal force on the breech during firing was equal to that force propelling the shot (Newton's Third Law of Motion); therefore the mechanical connection had to be exceptionally sturdy as well as highly efficient at sealing off the expanding gases. The two designs which were most widely adopted were the sliding wedge and the interrupted screw. Alfred Krupp was the pre-eminent steel manufacturer of Prussia and the most daring designer of heavy ordnance of the period; in his design he adopted the sliding wedge. This incorporated a large mass of steel forced against the flat machined breech and mortised in place during firing by a wedge-shaped

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<sup>16</sup>Greer, Recent Developments in Gun-making," pp. 397-98.

<sup>17</sup>Jobe, Guns, p. 147.

locking device which guarded against lateral movement of the breechblock. The other major breech design was the interrupted screw, a French adaptation of an American invention in which a breechblock on a hinged fitting could be inserted with a single thrust into a slotted and threaded breech with multiple teeth and locked with but one-sixth of a turn, engaging all the screw threads simultaneously. This design accomplished rearward obturation by means of a mushroom-like flexible head of asbestos and tallow on the inner face of the breechblock which expanded when pressed by the rearward effect of the expanding gases and sealed the cavities between the breech and breechblock.<sup>18</sup>

Many cannon designers questioned the concept of breech-loading because of a number of earlier catastrophic failures of breechloaders. Breechblockson Krupp weapons failed often in the Franco-Prussian War and several accidents occurred in which British guns fired before the breechblock was fully locked. Breech-loading was not adopted by the British Army until about 1880 when contiguous developments made such designs mandatory.<sup>19</sup>

Other factors, in addition to the problem of rearward obturation, combined to require a new approach to breech design. A larger propellant chamber was required to use the new powders, first to contain the increased volume of powder (now up to half the weight of the shot as opposed to

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<sup>18</sup>Greer, "Recent Developments in Gun-making," p. 399, and Jobe, Guns, pp. 148-150, and Goodrich, "Our New Naval Guns," pp. 674-75. The designs of these breechblocks has been enduring; in the 1970's West German and American Forces in NATO were using a self-propelled 155mm howitzer, Model M109, which was designed and built in the U. S.; however, the American howitzer was fitted with an interrupted screw breechblock while the West German forces model, otherwise identical, used a sliding wedge breechblock manufactured by Krupp.

<sup>19</sup>"Modern Artillery, p. 297, and Eugene Griffin, "Our Sea-Coast Defenses. North American Review 147 (July 1888): 73, and Jobe, Guns, pp. 150-51.



one-tenth in muzzle-loaders), and second, to provide enough air to permit the powders to burn rather than to explode.<sup>20</sup> Designers could provide this increased volume either by lengthening or by widening the powder chamber. Neither approach was easy to implement, since lengthening the chamber increased the length of the gun at the heavy (rear) end and made them extremely unwieldy, while widening the chamber meant that the bags of propellant were too large to be inserted through the muzzle.<sup>21</sup> Additionally, forward obturation (sealing spaces between the round and the interior of the tube to prevent gases from escaping forward around the projectile during firing) became more important with the long rifled barrels. If the higher pressure guns were to perform to their potential, the gas seal around the projectile must be as nearly perfect as possible. Such a seal was not possible when the round had to be rammed down the tube from the muzzle: either it would fit too tightly to permit manual ramming (since power rammers were impractical for muzzleloaders) or the shot would fit too loosely to provide efficient forward obturation. By the early 1880's, artillerists agreed that muzzleloaders were obsolete and the question of breech versus muzzle-loading had been largely decided, at least within the military services.<sup>22</sup>

The single critical innovation that made all the innovative developments possible was the development of large, high quality steel castings, for only steel possessed sufficient elasticity to withstand the forces experienced in the larger weapons. Steel is a variable combination of iron, carbon, and other metals (e.g., nickel, manganese), which was manufactured

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<sup>20</sup>"The Defense of Our Sea-Ports," p. 932.

<sup>21</sup>Goodrich, Our New Naval Guns," pp. 667-68.

<sup>22</sup>"Modern Artillery," p. 296.

in the nineteenth century by the crucible or open-hearth methods and cast, forged, or otherwise processed for the desired qualities.<sup>23</sup> The Krupp foundry at Essen, Germany, was the pioneer in manufacturing steel weapons. Founded in 1818, it made the first steel artillery piece in 1847 and monopolized the manufacture of steel weapons for several European countries by 1886.<sup>24</sup>

The so-called "built-up" design became the standard for the modern guns; with modifications, this type continues to be used in the last quarter of the twentieth century. A "built-up" gun is constructed by successively heat-shrinking tubes and hoops over the rear portions of the rifled barrel to put the gun in a state of compressed tension (therefore elastic resistance) which progressively increases rearward from the muzzle to the breech. Since the pressure within the tube on firing progressively decreases from the rear to the front as the projectile moves along the barrel, the resistance of the barrel to rupture is greater than the expansive force of the propellant all along the gun.<sup>25</sup>

The foregoing discussion does not detail the disputes over gun construction methods, such as whether wrought-iron coils wrapped on steel tubes, wire wound under tension over steel or cast-iron tubes, or cast iron hooped with steel would be the preferable or cheaper technique; nor does it deal with such innovative but eccentric constructions as the Lyman-Hascall multi-charge gun, nicknamed "The Sow, because its multiple powder charges protruded

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<sup>23</sup>Stevens, "Evolution of the Modern Heavy Gun," p. 152.

<sup>24</sup>U.S., War Department, USCAS, Comparisons of the Armaments of European Nations, by A. D. Schenck (Fort Monroe, Virginia: USCAS, 1886), p. 18, and Stevens, "Evolution of the Modern Heavy Gun," pp. 158-59.

<sup>25</sup>For a relatively non-technical treatment of the design development of the built-up gun, see Stevens, "Evolution of the Modern Heavy Gun," pp. 153-159.

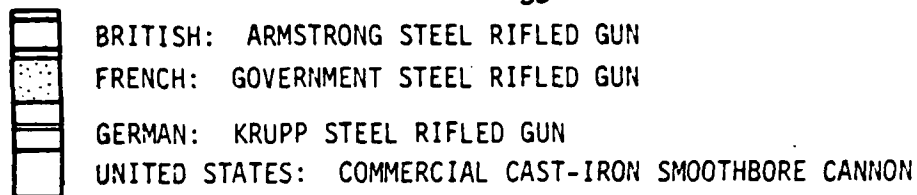
from the bottom of the cannon, resembling a mother pig preparing to nurse a litter.<sup>26</sup> Suffice to say that dozens of such inventions existed and there were champions within congressional constituencies for any method of construction or combination thereof. When legislation appeared in Congress requesting funds for production of artillery, the divergence of supposedly informed opinion, along with the complexity of the problem, were important factors in delaying legislation.

Although the cast-iron versus steel debate would continue in the United States Congress until around 1890, steel had been the exclusive metal for new artillery in the great European powers since the early 1880's.<sup>27</sup> (Characteristics of ordnance in service in European countries compared with that in the United States are shown in Figure 2). Debate over cast-iron or steel weapons continued in Congress after it had been decided in the military services and in Europe for several reasons. Cast-iron cannon were far cheaper than steel, and legislators favored limiting expenditures. Only a few companies in the United States could manufacture the high-grade steel forgings, while many could furnish cast iron, thus spreading the contracts to be offered. As illustrated in this chapter, the technology of the new guns was complex, and undoubtedly seemed even more so during the period of development. With the limited time Congressmen had available for technical

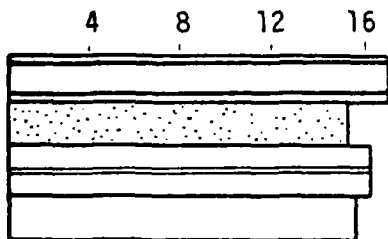
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<sup>26</sup>"Modern Artillery," p. 297, and Greer, "Recent Developments in Gun-making," p. 397, and Greene, "Our Defenceless Coasts," p. 60.

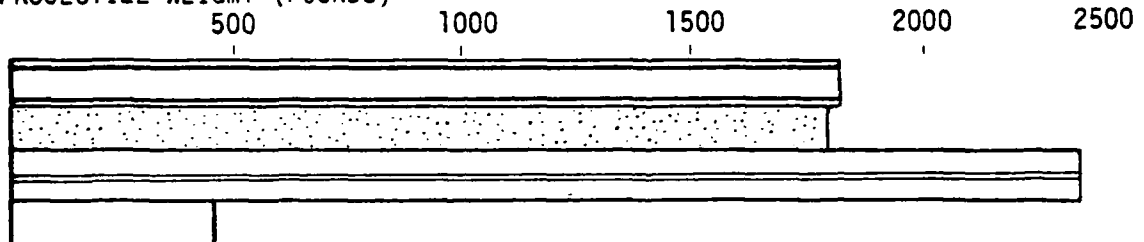
<sup>27</sup>U.S., War Department, USCAS, Changes Wrought in Artillery in the 19th Century, by Henry R. Lemly (Fort Monroe, Virginia: USCAS, 1886), p. 5, and U.S., War Department, Ordnance Office, Notes on the Construction of Ordnance, 20 July 1882-26 January 1884 (Washington, D.C.: War Department, 1884), no. 12, vol. 1, p. 1, and Ibid., no 13, p. 1, and Ibid., no. 16, p. 1, and Ibid., no. 21, p. 4.



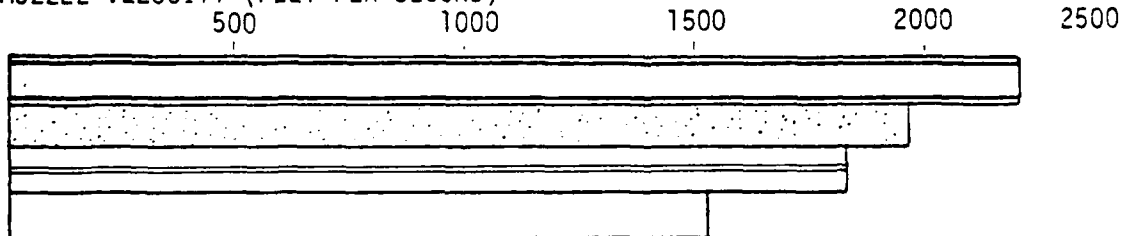
CALIBER (INCHES)



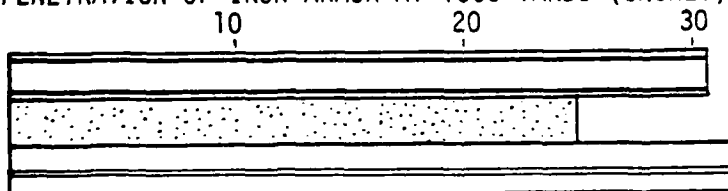
PROJECTILE WEIGHT (POUNDS)



MUZZLE VELOCITY (FEET PER SECOND)



PENETRATION OF IRON ARMOR AT 1000 YARDS (INCHES)



(ROUND SHOT OF US SMOOTHBORE HAD NEGLIGIBLE PENETRATION)

FIGURE 2

Characteristics of Ordnance in National Service 1889

SOURCE: John E. Greer, "Recent Developments in Gun-Making," Cosmopolitan 8 (December 1889) p. 400.  
 Emanuel R. Lewis, Seacoast Fortifications of the United States, p. 142.

study, they had to take the word of professionals in the field, but the reputation of the Ordnance Department within Congress did not inspire confidence. Congress often saw officers of the Ordnance Department as opposing innovation because of their reluctance to accept designs of independent inventors. Since each independent factory was a constituent of at least one Representative and two Senators, he could quickly appeal to Congress for redress of his rejection. Finally, since these technological changes had been accomplished in a single generation, it seemed not unlikely to some politicians that they might be surpassed as quickly. No committee of Congress wanted to vote funds for weapons that would be obsolete before they reached the field.

## THE REVOLUTION IN COASTAL FORTIFICATIONS

The revolutionary accuracy and effectiveness inherent in the new steel breech-loading rifles mandated equally revolutionary changes in the fortifications to house them. To design an effective fortification in any period has been a complex and taxing problem in military architecture. A fortification must fill multiple and sometimes conflicting roles. It must protect its contents, both humans and weapons. It must withstand all contemporary weapons and forces thrown against it. It must facilitate the use of its defensive weapons against the attacker. Finally, it must combine all these potential capabilities to discourage any attack against it by its sheer impregnability. Historically, military architects have been able to accomplish these formidable functional roles, at least with respect to coastal fortifications, fairly well. They have succeeded in spite of the multiple disciplines involved, for as a nineteenth century reviewer observed (speaking of eighteenth century fortifications), "the methods used in any particular time in fortifying positions reflect fairly the state of a multitude of other arts."<sup>1</sup> Military architecture, properly executed, is the triumph of functionalism in design. Despite the numerous attempts throughout history to codify and publish rules for the planning of

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<sup>1</sup>"Vauban, Montalembert, and Carnot," The Saturday Review 63 (12 February 1887): 236.

fortifications, the process has eluded such definition; many attempts have been virtually outdated when published because they described the state of the art as it was, not the direction in which it was evolving. Fortifications must be designed within the parameters of the weapons which threaten them and those which defend them,<sup>2</sup> and new weapons can usually overcome old fortifications.

For the United States, coastal fortifications had traditionally represented a particularly attractive method of providing for her defense needs. The history of warfare had repeatedly demonstrated the vulnerability of ships to shore-based guns and the relative invulnerability of coastal fortifications to fire from ships, except when the attacking fleet was overwhelmingly superior in firepower, or the attacker could afford to be profligate in accepting losses. Fortifications were a superior alternative to a navy for coast defense, both in expertise and efficiency. Fortifications were far cheaper than a navy in initial outlay, as well as in maintenance and replacement costs. To defend the entire coastline of the United States effectively would require a huge navy; an attacking fleet could concentrate and attack a harbor before the defending navy had time to concentrate, thus mandating several squadrons of ships to defend separate sectors of the coast or groups of harbors. Once the large navy were built, it would have to be manned continually and maintained, while fortifications could be neglected until war came, when they could be at least partially manned by militia and volunteers. Even obsolescent fortifications, up to the time of breech-loading rifles, could stand a good chance of defeating

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<sup>2</sup>Quentin Hughes, Military Architecture (New York: St. Martin's Press, 1974), p. 7.

newer or modern ships. Finally, while many felt that a large navy could by its very existence lead to war, no such possibility existed regarding fortifications. Coastal defenses were patently defensive in nature; their existence could never lead to military involvements. On the contrary, many American observers felt that efficient coastal fortifications could buy both peace and security at bargain prices.<sup>3</sup>

The fortifications that stood on American coasts in 1880 were the product of a movement to defend the nation's coasts which had been carried out in the first half of the century. With the War of 1812 fresh in their memories, America's military planners set about improving coastal defenses to such a state that there would be no fear of a repetition of the burning and bombardment of coastal cities which had occurred in that war. In 1816, the Board of Engineers published "principles for the defense of our coasts" which formed the guidelines for the building program completed by the start of the Civil War:

1. They must close all important harbors against an enemy, and secure them to our military and commercial marine.
2. They must deprive an enemy of all strong positions . . . .
3. They must cover the great cities from attack.
4. They must prevent, . . . the great avenues of interior navigation from being blockaded at their entrance into the ocean.
5. They must cover the coastwise and interior navigation, by closing the harbors. . . .
6. They must protect the great naval establishments.<sup>4</sup>

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<sup>3</sup>Emanuel Raymond Lewis, Seacoast Fortifications of the United States: An Introductory History (Washington: Smithsonian Institution Press, 1970), pp. 3-5, fn. 2, p. 3, and George N. Southwick (Representative, New York), "Our Defenceless Coasts," North American Review 162 (March 1896): 326, and "The U.S. Coast Defenses," Scientific American, 14 July 1894, p. 22, and W. R. King, "The Defence of New York," Harper's Weekly 35 (15 August 1891): 619.

<sup>4</sup>"The U.S. Coast Defenses," Scientific American (14 July 1894), p. 22.



An analysis of these principles of 1816 shows that the term "coast defense," as used by the nineteenth century American planner implied a very different group of functions than the same term used by a British planner, who had to design fortifications both to defend harbors and to repel invasion. The American planners viewed coast defense as a protection of critical points such as large cities, harbors, broad estuaries, or navigable rivers. They had no thought of attempting to fortify the entire coastline against invasion. To avoid insuperable problems of style as well as anachronistic language, the term "coast defense" will be retained in this study, but it is important that the reader bear in mind that it implies something much closer to "harbor and estuary defense," and that this lack of precision in definition caused as many problems to the nineteenth century publicists and politicians as to the twentieth century student.

The fortifications that resulted from the movement following the War of 1812 were varied in design. Some were linear fortifications which stretched for long distances, mounting guns in a single row; others were mounted in circular towers to give the advantage of height where terrain did not otherwise provide it. But the most characteristic, and most dramatic design was the huge batteries of masonry casemates stacked row upon row like offices in a modern building. Such massing of fire was necessary because of the relative short ranges and inaccuracy of the cast-iron, smooth-bore, muzzle loading cannon of the day. Likewise, the vertical fortification was only possible because the wooden sailing ships which might attack them mounted the same inaccurate and relatively small cannon. Designers of land fortifications had been forced to abandon such vertical masonry forts centuries before, when the artillery developed large siege guns which could fire at a single point on the wall of a fortification and with repeated hits, finally breach the wall. Such a cumulative effect of

repeated hits on the same point on a wall was not possible given the inaccuracy of firing from ships; since the cannon balls caused relatively little damage when hitting the vertical walls at random, the multistoried design survived in coastal fortifications.<sup>5</sup>

The casemated batteries were an evolutionary solution to a design problem of several parameters. These parameters were the same classic problems of military architecture outlined above, that is, maximize protection, minimize risk of damage, facilitate use of defensive weapons, and maximize deterrent role. Given the weapons available for offense and defense, they fulfilled all requirements admirably. The casemates were usually a hall-like succession of brick vaults of extremely heavy construction. Each casemate was left open at the back to facilitate ventilation during firing. While the front of the casemate was heavily fortified with stone, preferably granite, up to ten feet thick; casemates could be constructed on top of one another, limited only by the skill of the architect and the physical limitations of his materials and the geology of the area. In some later casemates, the stone was sheathed with cast-iron or steel armor plating. The firing port was a rectangular arched opening in the stone presenting an opening which was as small as possible at the front, but which tapered outward toward the rear to allow the cannon, whose muzzle would reach almost to the front of the opening, to have a limited traverse and elevation capability. Traverse was usually limited to 120° (60° left and right of center). This limitation on traverse perpetuated one of the most characteristic features of earlier plans for fortifications, which is the polygonal, often hexagonal, shape (see Figure 3).

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<sup>5</sup>Lewis, Seacoast Fortifications, pp. 37-57, 67, and "Conditions of the Fortifications," p. 2.

The best locations for coastal fortifications were those which commanded long expanses of open sea around a harbor or those which commanded the entrance to a channel leading inland. At either type of location, the fortification had to be able to bring fire over a traverse of from  $180^{\circ}$  (in the case of a fort on a straight beach) up to  $360^{\circ}$  (in the case of an island commanding a channel entrance). To avoid "dead spaces" (i.e. areas in which the fortification could not fire on ships but from which ships could fire on the fort), the casemated batteries had to have multiple walls which themselves intersected at not less than the  $120^{\circ}$  traverse of the guns. Since the hexagon is a regular polygon comprised of  $120^{\circ}$  angles, the hexagon or a truncated hexagonal shape was the most common shape for fortifications of the day. Many variations were possible: cast-iron doors on the firing ports, bastions, differing designs of gun mounts, and supporting facilities such as arsenals, magazines, and living quarters. Nonetheless, the overall design features show a remarkable similarity in the pre-Civil War coastal fortifications; from a perspective of military architectural history, the fortifications have the charm of the earlier days of Vauban, a charm that would disappear in later designs. In spite of their architectural similarity to the coastal fortifications of earlier centuries, for their time and purpose the coastal fortifications of the United States were entirely adequate and possibly the best of any country in the world in 1860.<sup>6</sup> But these often elegant examples of functional architecture were entirely outmoded in their ability to defend against the weapons of 1880.

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<sup>6</sup>Eugene Griffin, "Our Sea-Coast Defenses," North American Review 147 (July 1888): 66, and "Condition of the Fortifications," p. 3, and Lewis, Seacoast Fortifications, pp. 42-66. The portion in Seacoast Fortifications is particularly valuable in its profuse illustrations, showing the variety in detail but the overall similarity of the designs.

The steel breech-loading cannon could destroy a masonry fort, causing the bulk of the fortification to be a positive danger to its inhabitants because of the spalling effect which the high velocity projectile caused on the stone walls of the fort.<sup>7</sup> Although the firing from on board ship would continue to be less accurate than aimed fire from fixed shore bases, the fire from ship-mounted breech-loading cannon was accurate enough to insure hitting the vertical casemate walls. If a casemate could be hit, it could be destroyed, and thus began the search for a new approach to the design of coastal fortifications.

Although there was much discussion about the new artillery technology by 1880, there was little appreciation for the changes in the design of fortifications which the new guns would mandate. Early in the decade, however, an incident occurred which gave an object lesson in many of the changing relationships between modern cannon on shore defending against modern cannon from shipboard. This was the British bombardment of Alexandria in 1881. The incident is little more than a footnote to both the diplomatic and military history of the period, but its impact on the design philosophy of coastal fortifications was considerable until the turn of the century. In May of 1882 nationalist uprisings threatened stability in Egypt and the security of the Suez Canal. In response, the British and French governments sent a joint naval squadron to Alexandria, but with instructions to do nothing there except observe events. On 11 July, with the nationalists continuing to riot in Alexandria and throwing up earthworks outside the city, Admiral Sir Beauchamp Seymour acted without orders and bombarded the

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7". . . our masonry forts cannot withstand such an armament . . . the granite splinters scattered by each penetrating projectile would be an additional source of danger to our cannoneers." Eugene Griffin, "Our Sea-Coast Defenses," North American Review 147 (July 1888): 67.

old forts outside the city. The forts soon surrendered and the British landed forces.<sup>8</sup> The easy victory served to obscure the details and

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<sup>8</sup>A. J. P. Taylor, The Struggle for Mastery in Europe, 1848-1918 (Oxford: Oxford University Press, 1954), pp. 288-289, and William L. Langer, ed., An Encyclopedia of World History, 4th ed. (Boston: Houghton Mifflin Co., 1968), p. 868. The only other example of modern guns on ships shelling coastal fortifications was that of the French bombardment of Sfax, in Tunisia in 1881. There they fired 2002 shells "under peace-practice conditions" yet scarcely damaged the defensive potential of the works; but this shelling was not as well-publicized in American professional journals and appeared little to affect shore defenses, and George Sydenham Clarke, "Extracts from an Article on the Protection of Heavy Guns for Coast Defense," USNIP 13 (1887): 251; no examples of modern guns aboard ship duelling with modern guns in fortification appear to have occurred before the twentieth century.

The most famous example of naval bombardment of fixed fortifications in the U.S. Civil War was the shelling of Fort Fisher, near Wilmington, North Carolina, in January 1865. Neither the fort, its armament, the attacking fleet, nor the length and intensity of the naval attack were typical of warfare of the period, but the operation does provide a case of naval forces playing the dominant role in defeating fortifications. Fort Fisher was an earthen fort with walls constructed at a forty-five degree vertical angle, revetted with marsh sod. It was situated on an island commanding the approaches to Wilmington, and could thus be shelled both from the ocean and from Cape Fear River. The fort mounted ten 10" and ten 8" cast-iron smooth bore cannon, and a number of smaller guns. A Union fleet of four monitors and three frigates fired on the fort for two days and nights before being joined by fifty-two more ships which added their fires to the bombardment for another day and night. Total numbers of guns on the ships and rounds fired differ in accounts of the shelling, but apparently between three and six hundred guns fired about 50,000 shells on Fort Fisher during the attack. The shelling broke down the earthen walls, tearing the marsh grass revetting off them and reducing their angle to about thirty degrees. All the guns on the river side of the fort were put out of action, while seventeen out of twenty-three guns on the ocean side remained serviceable and none were dismounted. One reason for the disparity in damage on the two fronts may have been that fire from the comparatively calm river channel was probably more accurate than the fire from the Atlantic. After an infantry assault marked by fierce fighting, the fort surrendered. The naval attack was unparalleled in the Civil War; whether any fortification could have survived such an assault is questionable. Nonetheless, a stone fortress with more large guns could probably have stood up to the punishment of the naval artillery longer, while preserving more of its own fighting power and inflicting more damage on the attacking navy. For details of the operation, see The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies, 70 vols. (Washington: GPO, 1894), series 1, vol. 46, part 1, pp. 394 ff, particularly pp. 407-409, 435-440; also Colonel William Lamb's account in Southern Historical Society Papers, 10 (January-February 1832): 353-356. For a short entry on the inability of the Union Navy to reduce Fort Sumter by naval artillery alone (although only a small fleet of eight monitors and one ironclad were used), see the entry in Mark Mayo Boatner, III,

underlying implications of the engagement for several years, but when they came to light, they had a profound effect on the design of coastal defenses.

A British officer was the first to appraise professionally the implications of the bombardment of Alexandria. Major George Sydenham Clarke of the Royal Engineers published an article "On the Protection of Heavy Guns for Coast Defense" in the Proceedings of the Royal Artillery Institution in February 1887. In it, he outlined the action at Alexandria and then analyzed its meaning for the military architect, later expanding this analysis in his important work on fortifications in 1890. The British had shelled Fort Meks, a medieval work in the desert defending Alexandria. The fort had a mixture of old cast-iron muzzle-loading and new steel breech-loading cannon; fortunately for the British, the Egyptian artillerymen were poorly trained in operating the new steel guns. Using modern breech-loading naval guns, the Monarch, Penelope, Invincible, and Temeraire shelled the fort for three and a half hours, while a fifth ship, the Inflexible, fired for one hour. The Egyptian guns were not mounted in casemate battery, but behind a low parapet which protected the guns and crews from all except a direct hit. The British ships had difficulty in aiming at the guns themselves during the action as they were obscured by smoke while they were firing. The ships fired 580 heavy and 340 light projectiles. Most of the shots passed harmlessly over the guns, with only one shot in nineteen hitting just as harmlessly on or below the defensive parapet. Only two shore guns were hit and neither were put out of action by the shelling, although one was destroyed by short-range fire after the fort had surrendered and at a time when the shore battery was no longer obscured by smoke. The

Egyptians had no machine guns to disturb the aim of the ships, although they scored twenty-three harmless hits on the ships from the shore-based cast-iron cannon. The accuracy of the ships was at least as high and probably higher than could be expected in engagements against better prepared positions both because of the lack of machine guns and the poor training of the Egyptians in modern gunnery.<sup>9</sup>

Major Clarke drew two implications for coastal defenses from his analysis: first, all effort in future design should be in the direction of invisibility of the defending guns, and second, given the attainment of virtual invisibility, the shore defenses would be invulnerable. Many measures were possible to decrease the visibility of the guns, from simple camouflage to extensive use of landscape architecture, but the central theme of his approach was that any preconceived notions or historical examples of coastal fortifications were obsolete and must be abandoned; the elegant geometry of earlier defenses was gone forever. Future coast defenses must be individually designed from a purely functional approach, discarding the often eclectic designs of the past; given the terrain available to protect a given harbor or estuary, the task of the military architect became how best to exploit its natural features to deliver fire on ships with the least exposure and maximum protection. No longer would shore defenses be imposing architectural edifices placed on the terrain, rather they would become sunken and hidden gun mounts lying within the folds of the terrain.

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<sup>9</sup>Clarke, "The Protection of Heavy Guns," pp. 251, 253-254, and Clarke, Fortification: Its Past Achievements, Recent Developments and Future Progress (London: John Murray, 1890), pp. 180-183. Another feature of the bombardment of Alexandria that was unrealistic with respect to most confrontations was that the fleet virtually exhausted its ammunition in the bombardment; one ship had only ammunition for one hour's shelling at the finish. In an engagement where the fleet might have to contend with a hostile navy before resupply, such expenditures would be disastrous; James H. Sears, "The Coast in Warfare," USNIP 27 (1901): 470.

From their invisibility the defenses would derive their invulnerability.<sup>10</sup>

The new principles of design were simple, but their ramifications were complex. The designer must determine the armament required to defend a position and weigh it against the local terrain and the criticality of the place to be defended. Given this analysis, he must design the defense to give the fullest scope to the offensive potential of the guns, bringing the most fire on areas where ships would be most vulnerable, and providing the maximum protection to the guns and their crews. The tendency should be toward simplicity in the fortifications, particularly since it was toward greater complexity in the modern artillery. Vertical and horizontal dispersion of the guns would assist in the defense by making the attacker's problem more difficult. Where possible, measures must be taken to avoid showing the silhouette of the gun against the skyline. The ideal position would be one where the terrain sloped gently up to the parapet for several hundred yards, then leveled off for a few hundred yards, then rose again on a wooded slope behind the position. Such a position would have formidable passive defenses. The parapet would serve to cause rounds hitting it to ricochet harmlessly over the position, or to bury themselves in the earth. The flat areas behind the guns would make visual spotting of rounds from shipboard much more difficult; should the rounds hit the wooded slope to the rear, their impact and smoke would be unseen, hidden by the forest. Invisibility could be enhanced by painting the guns in camouflage patterns and by leaving a natural appearance to the area, with a rough foreground, avoiding any clean edges or well-trimmed look. Above all the designer must avoid providing aiming points for the ships in the form of fixed objects.

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<sup>10</sup>Clarke, Fortification, pp. 147, 152, 266; and George Seton, The House of Moncrieff (Edinburgh: N.p., 1890), pp. 121-122.



Otherwise, the design problems were minimal. Only a small infantry force need be provided, preferably in a central keep, augmented by obstacles on any natural approaches. The gun emplacements should be wide concrete arcs to allow maximum traverse, well-drained, with adequate storage area for ammunition, crew shelter, and water supply.<sup>11</sup>

Given the functional basis for design of the gun emplacements, the remaining question was that of the best gun mount to enhance the invisibility of the defenses. In this area, as in the design of the guns themselves, there were a number of competing ideas, varying in complexity, feasibility, and expense. In the present discussion, all but two may be omitted, for the two designs and their variants constituted almost all those that were actually fielded: the barbette mounting and the disappearing carriage.

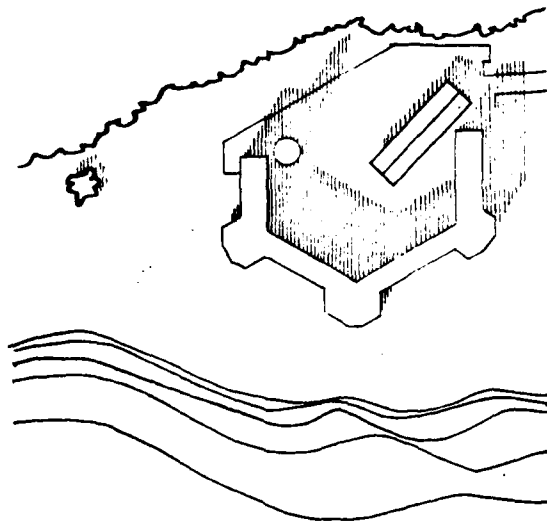
The barbette mount might be more descriptively called the center pivot mount, for it is a fixed column which raises the gun over the parapet far enough to allow maximum traverse and elevation of the gun. It was the most common mount for guns on ships, and was the simplest mount for shore guns. It had the advantages of simplicity, reliability, and low expense. Its primary disadvantage was that the gun remained visible at all times and thus the gun crew was at least partially exposed during reloading operations. In a well-designed emplacement, the problem of visibility could be greatly reduced by camouflage painting and by a wooded or broken background.<sup>12</sup>

The disappearing carriage was an invention made during the period of change from muzzle- to breech-loading cannon. The first practical design

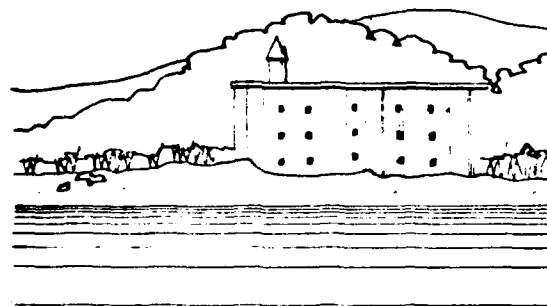
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<sup>11</sup>Clarke, Fortification, pp. 149-152, 199, 262-267.

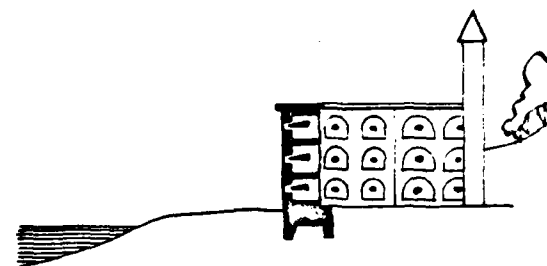
<sup>12</sup>Ibid., p. 158. For a concise treatment of the many types of proposed gun mounts, their advantages and disadvantages, see *ibid.*, pp. 153-162 and 164-172. For pictures of American barbette mounts, see Lewis, Seacoast Fortification, pp. 47, 62, 81, 90.



Plan



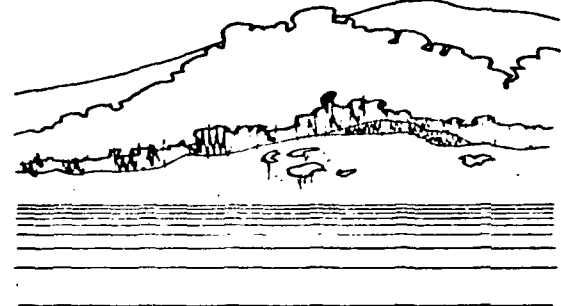
Elevation



Section



Plan



Elevation



Section

FIGURE 3

Typical Casemate Battery and Disappearing Carriage Guns on Same Terrain. Imaginary site, no scale. Lewis, Seacoast Fortifications, pp. 46-57, 90-91.

was that of Alexander Moncrieff of the Royal Artillery. Moncrieff formed the idea of the disappearing carriage while observing the bombardment of Sevastopol during the Crimean War, but his design was not tested until much later. In principle the design was simple: it harnessed the recoil of the cannon during firing to raise a counterweight as the cannon moved to the rear and down. The cannon could then be reloaded from behind cover and the stored potential energy of the raised counterweight used to raise the gun back into battery for firing. In practice, the system was not so simple, involving complex problems in mechanical and hydraulic engineering.<sup>13</sup> It remained for two American officers, Colonel A. R. Buffington and Captain William Crozier to perfect the system in what would be known as the Buffington-Crozier carrier. Not developed until the mid-1890's, the Buffington-Crozier carriage employed the same counterweight principle, using hydraulic pistons to absorb and slow the recoil as the gun reached the loading position. When the gun reached its extreme rear position, pawls engaged catches to hold the gun for reloading. After reloading and aiming the gun, the pawls were tripped and the counterweight lifted the cannon into firing position. The gun fired automatically when it reached the in-battery position, and the recoil took one second to return to the reloading position (see Figure 4). The system was efficient and effective; a well-trained crew could fire a ten-inch gun at a rate of two rounds per minute.<sup>14</sup>

In addition to the heavy guns, there were a number of other measures

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<sup>13</sup>Seton, House of Moncrieff, pp. 120-122, and Clarke, Fortification, pp. 164-165, and "The Protected Barbette, or Moncrieff System," Blackwood's Magazine 142 (August 1887): 230-234, and Ian V. Hogg, A History of Artillery (London: Hamlyn, [1974]), pp. 93-94.

<sup>14</sup>NYT, 16 April 1894, p. 13, and Lewis, Seacoast Fortifications, p. 80, and Hogg, History of Artillery, p. 93.

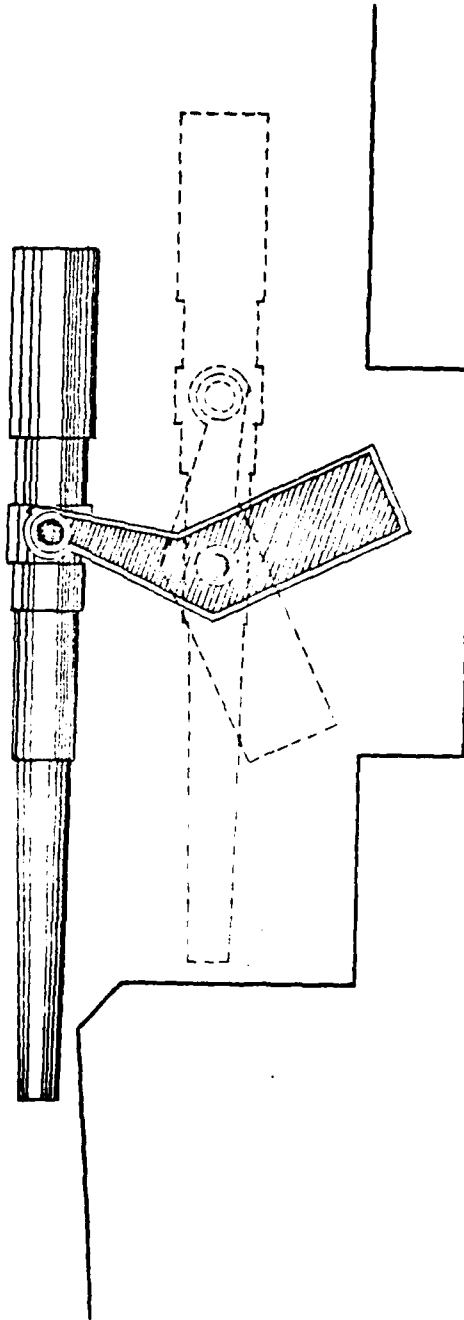


FIGURE 4

Schematic of Functioning of Buffington-Crozier Carriage

Gun pictured in firing position over parapet; dotted lines show gun held at full recoil for reloading. Counterweight pictured schematically for clarity; does not show actual design. Gun mount and hydraulic systems omitted for clarity.  
See Lewis, Seacoast Fortifications, pp. 73-82.

proposed for coast defense. Mortars would come to play an important role because of their ability to deliver plunging fire on the armored decks of attacking ships. Some inventors and technicians would propose increased use of submarine mines and torpedoes for defense. The Navy wanted to build coast defense ships and rams in order to have a part of the coast defense mission. Inventors would propose a great variety of types of devices with theoretical application to the problem. There was to be no firm consensus on exactly how best to provide for coast defense until the new steel breech-loading cannon were proven.<sup>15</sup> As Major Clarke expressed the situation:

No science is so delightfully empirical as that of fortification. The test of experiment cannot be satisfactorily applied to it; that of practical experience is uniformly ambiguous. No fact is so unimportant that an instance cannot be found which affects to illustrate its utility; no office table theory so unpractical, that evidence of some sort cannot be produced for its support. For the data are never scientifically complete, and each successful or unsuccessful attack or defense may generally be traced to any one of a dozen causes in accordance with the personal predilections of the writer.<sup>16</sup>

But in spite of the contributing roles played by the other weapons, the raison d'etre for the new fortifications was still the high-powered steel guns. Previously, the armament for coastal fortifications had been only a small fraction of their cost (one-eighth or less), but after 1885 armament would account for three-fourths or more of the total cost.<sup>17</sup> Only

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<sup>15</sup>For the use of mortars, see Clarke, Fortifications, pp. 106-107 and Lewis, Seacoast Fortifications, pp. 79-86, and for torpedoes and mines, see "The Defense of Our Sea-Ports," Harper's Weekly 71 (November 1885): 928-930 and the "Endicott Report," p. 97; for the Navy's role, see "New Harbor Defense Vessels," Harper's Weekly 42 (1898): 1058, and the "Endicott Report," pp. 305 ff., and W. T. Sampson, "Outline of a Scheme for the Naval Defense of the Coast," USNIP 15 (1889): 169-232, passim; for inventions which never proved effective, see F. Heath, "Dynamite Guns for the Defence of San Francisco," Harper's Weekly 40 (1896): 199, and the description of the "Zalinski Dynamite Guns" in Hogg, History of Artillery, pp. 85-87; also Henry L. Abbott, "Coast Defense," Scientific American 70 (12 May 1894): 298.

<sup>16</sup>Clarke, Fortifications, p. 1.

<sup>17</sup>Quentin Hughes, Military Architecture (New York: St. Martin's Press, 1974), pp. 205-206 and Lewis, Seacoast Fortifications, p. 78.

the heavy, long range gun could cripple an enemy fleet approaching the shore.<sup>18</sup>

Difficulties caused by the changes in fortifications were similar to those caused by the new gun technology: how could the legislators and laymen be convinced that such changes were so momentous as to require action? In the case of fortifications, the lawmakers must be convinced that the fortifications which had been the best in the world in 1860 were now worse than worthless, in fact, positive hazards to the gunners inside them.

Professionals in the military realized the full effect of the dual technological revolutions in artillery and fortifications during the decade following the Civil War. Had the only technological innovation of the mid-century period been the rise of ironclad steamships, engineers could have modified the fortifications by mounting larger cast-iron weapons, but the advent of steel armor and the improvements in cannons sounded the death knell of all such simple solutions. By the end of the 1860's the military leaders were able to convince some leaders in government of the problem. In 1869, a group of planners were selected to propose the future course of fortifications. They recommended, after observing firing trials on masonry fortifications, that further improvement of the existing forts not be made. The report pointed out that although strengthening the forts to withstand bombardment by the best U.S. weapons of the day was theoretically possible, it was unlikely that they could withstand weapons then being developed in

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<sup>18</sup>U.S., Ordnance Department, Annual Report of the Chief of Ordnance to the Secretary of War for the Fiscal Year Ended June 30, 1887 (Washington, D.C.: War Department, 1887), p. 11.

Europe.<sup>19</sup> Unfortunately, the engineers' inspired no attempt to replace existing defenses along more effective lines; instead, a decade of lethargy in coastal fortifications ensued.<sup>20</sup>

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<sup>19</sup>Griffin, "Our Sea-Coast Defenses," p. 66, and "Conditions of the Fortifications," p. 3.

<sup>20</sup>"Taft Report," p. 1.

## THE POLITICS OF COAST DEFENSE 1880-1889

In the decades immediately after the Civil War, few Americans were seriously concerned with potential overseas enemies. With the great internal conflict behind them, the citizens were more occupied in Reconstruction, continental expansion and improvement, and developing industry than they were in preparing for international squabbles far beyond their foresight. The Army and Navy contracted to become small forces for keeping the peace on the frontiers and protecting maritime commerce.<sup>1</sup> Congress routinely made small appropriations to maintain the coastal fortifications, but envisioned no improvements or even the need for improvements.

Within the small military services, however, thoughtful officers were turning inward and examining their roles in society as well as the technological developments of other armies and navies. By the late 1870's the lessons of the use of Krupp's steel breech-loading cannon in the Franco-Prussian War had become a popular subject for discussion in the American

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<sup>1</sup>W. R. King, "Defence of New York," Harper's Weekly 35 (15 August 1891): 618, and Eugene Griffin, "Our Sea-Coast Defenses," North American Review 147 (July 1888): 66, and Editors of American Heritage, The Confident Years (New York: American Heritage Publishing Co., 1969), pp. 37-144 passim, and Russell F. Weigley, The American Way of War: A History of United States Military Strategy and Policy (Bloomington, Indiana: Indiana University Press, [1977], [reprint ed., New York: Macmillan, 1973]), pp. 158-169 passim.



armed services; planners saw the powerful guns and navies then building in Europe as potential threats.

The military perceived a need for improvement in ordnance and sea-coast defenses, but the Democratic Congress<sup>2</sup> was ambivalent on the question of any foreign threat and felt the pressure of their constituents for public works projects more acutely than the needs for defensive improvements. General Winfield S. Hancock, commander of the Department of the East, and therefore commander of all forts on the northeastern seaboard and Great Lakes, wrote Representative S. S. Cox (R-N.Y.) early in 1880 that ordnance was the most important defense question of the day, since it took so much time to develop; in the event of war, without the time to develop and produce ordnance, money alone would accomplish little.<sup>3</sup> When the appropriations bill for fortifications came before the House, there was little debate, even though it requested only \$100,000 to maintain the fortifications, with no funds provided for new ordnance. In the Senate, the New York delegation characterized the measure as "utterly inadequate,"<sup>4</sup> but the prevailing sentiment appears to have been that any international conflict was unlikely, and the bill became law.<sup>5</sup> The New York Times was consistently an advocate

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<sup>2</sup>46th Congress: House: D149, R130; Senate: D42, R33. (This and subsequent data on Congressional composition are from Webster's Guide to American History (Springfield, Mass.: G. & C. Merriam Co., [1971]), p. 776. In the national party platforms of 1880, neither major party mentioned military policies, except for the Democratic Party affirmation of the dominance of civil over military power. The Republican platform spoke of the duty of Congress to develop and improve the sea coasts and harbors, but did not address their defense. Kirk H. Porter, National Party Platforms (New York: Macmillan Co., 1924), pp. 99-101, 108-112.

<sup>3</sup>Letter, General W. S. Hancock to Hon. S. S. Cox, 10 January 1880; reported in NYT, 15 January 1880, p. 2.

<sup>4</sup>NYT, 13 March 1880, p. 1.

<sup>5</sup>SAL, 21: 109: 80.

of improved fortifications, commenting editorially that "No topic requiring legislation gives [Congress] an easier opportunity for creating irresolution . . . than . . . public defenses."<sup>6</sup> The policy of waiting for perfect ordnance, as some advocated, was fraught with danger because heavy guns, unlike armies, could not be extemporized, while the very defenselessness of the nation invited attack.<sup>7</sup> Although there may have been no immediate threat, the foreign policy of the United States was paralyzed by its defenseless condition; as a later editorialist expressed it, the Monroe Doctrine could not be enforced because the rich harbors of the country were in danger of "being blown out of the water by any third rate power that happens to take us at our Word."<sup>8</sup>

The military planners apparently felt that the legislative problem may have been one of ignorance rather than unwillingness; if the planners could carefully and didactically outline the changed technology and its implications for shore defenses, the legislators would agree to vote funds for improvement. At any rate, virtually every annual message of the President and every annual report of the Secretary of War, Army Chief of Ordnance, and Chief of Engineers in the decade of the 1880's mentioned the defenseless nature of the coastline of the United States, often in some detail. President Rutherford B. Hayes, in his message to Congress in 1880, said:

Especial attention is asked to the report of the Chief of Engineers upon the condition of our national defenses. From a personal inspection of many of the fortifications referred to, the Secretary is able to emphasize the recommendations made, and to state that their incomplete and defenseless condition is discreditable to the country.

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<sup>6</sup>NYT, 20 March 1880, p. 4.

<sup>7</sup>Ibid.

<sup>8</sup>NYT, 31 May 1880, p. 3; quote in editorial, 16 December 1880, p. 4.

While other nations have been increasing their means for carrying on offensive warfare and attacking maritime cities, we have been dormant in preparations for defense. Nothing of importance has been done toward strengthening and finishing our casemated works since our late civil war, during which the great guns of modern warfare and the heavy armor of modern fortifications and ships came into use among the nations, and our earthworks, left by a sudden failure of appropriations some years since, in all stages of incompleteness, are now being rapidly destroyed by the elements.<sup>9</sup>

In the Chief of Engineer's Annual Report for 1881, General H. G. Wright described the more than six hundred modern guns the British had in their coastal fortifications, while the United States possessed neither modern guns nor armored forts. He outlined the revolution in technology, describing the antiquated cast-iron, smoothbore cannons as adequate against wooden ships, but not against modern steel armored ships.<sup>10</sup> At the same time, General W. T. Sherman, then commander of the Army, said that the fortifications then standing should be abandoned because they were ineffective against steel ships and garrisoning them with his limited resources detracted from other missions the soldiers could be performing.<sup>11</sup>

As a part of the 1881 appropriations bill for fortifications, passed on 3 March 1881, Congress required Robert T. Lincoln, then Secretary of War, to report to them on "the condition of the fortifications, and what number of them, if any, can be dispensed with."<sup>12</sup> The report outlined the situation, as the planners saw it, in detail. In Lincoln's letter transmitting the report he observed that the reasons for coast defense had not changed

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<sup>9</sup>Quoted by Representative Hatch speaking for the Fortification Appropriation Bill in U. S., Congress, House, Congressional Record, vol. 21, H. R. 8391, 51st Cong., 1st Sess., 1 April 1890, p. 2884.

<sup>10</sup>NYT, 7 November 1881, p. 2.

<sup>11</sup>NYT, 8 November 1881, p. 2.

<sup>12</sup>"Condition of the Fortifications," p. 1, and SAL, 21: 468: 135.

since the original sites for fortifications had been selected, even though the technological parameters governing coast defense had changed markedly. The report went on carefully and lucidly to reiterate the technological revolution that had occurred in naval technology in the change from sail to steam and from wooden to steel ships. He cited an 1869 report by the Board of Engineers which had examined the fortifications and proposed modifications. Even at that early date, the engineers had recommended against strengthening the masonry forts, correctly predicting that sheathing the masonry with armor could not indefinitely stay ahead of the technological progress in naval artillery.<sup>13</sup>

Instead of attempting to strengthen existing forts, the engineers of 1869 had recommended that earthen batteries be constructed to mount twelve-inch rifles, supported by heavy mortar batteries nearby to deliver plunging fire on attacking ships. These batteries should then be augmented with channel obstructions in the form of minefields (in the parlance of the day, "torpedoes"). Owing to lack of appropriations, the engineers had been able to make few of the recommended improvements. In the interim between 1869 and 1881, dramatic developments had occurred in artillery, and General Wright described the improved capabilities of a British twelve-inch gun<sup>14</sup> which could theoretically penetrate twenty-four inches of iron at close range. By contrast, the best coast artillery weapons of the United States were Civil War vintage fifteen-inch smooth-bore muzzle loading cannon and a few ten-inch smooth-bore cannon that had been converted into eight-inch rifles. After detailing the depressingly inadequate inventory of defenses

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<sup>13</sup>"Condition of the Fortifications," pp. 3-4.

<sup>14</sup>The gun was not identified but was probably an Armstrong 12" rifled muzzle-loading cannon; the British had not fully abandoned muzzle-loading by 1881.

at each existing fortification on the coasts of the United States, General Wright concluded that the nation's harbors were all but defenseless from an attack by sea. "It must be apparent," he said

. . . that the defenses designed for their protection in their present unfinished condition are altogether insufficient for the security of our important harbors, the centers of commerce, manufactures, and wealth; of many minor harbors, which nevertheless have large interests at stake; of roadsteads useful as a refuge for our commercial and naval marine, and of our navy-yards.<sup>15</sup>

He suggested retaining the masonry forts, but only as magazines, living quarters, and strong points. He recommended a vigorous program of construction of guns and fortifications, comparing the lethargy of the United States with British action. He pointed out that Great Britain was sending eighty and one-hundred ton rifled cannon to strengthen Gibraltar and Malta, chauvinistically adding the purely economic assessment that these were "points that cannot compare in importance with New York, Philadelphia, San Francisco, and New Orleans."<sup>16</sup>

The day before Secretary Lincoln sent his report to Congress, President Chester A. Arthur had mentioned the need for coast defenses in his first annual message to Congress, saying that although the country was at peace, the nation must always be ready for a "resort to arms." The nation must prepare, he said, both to defend the harbors and to protect the foreign trade. He would reiterate the theme, ever more forcefully, in succeeding annual messages.<sup>17</sup> The New York Times was quick to agree, describing the

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<sup>15</sup>"Condition of the Fortifications," pp. 4-23; quote, p. 22.

<sup>16</sup>Ibid., pp. 5, 23.

<sup>17</sup>6 December 1881; Messages and Papers, vol. 10, pp. 4638-5839. The next year President Arthur called the existing fortifications "notoriously inadequate to the defense of the great harbors and cities for which they were built." He recommended that Congress wait for the report of the Gun Foundry Board, but implement its proposals without delay. Messages and Papers, vol. 10, p. 4724.

nation's Navy as "humorous," but the country's ordnance as even more absurd because of its obsolescence.<sup>18</sup> A month earlier, an editorial had described coast defense as no light matter, since armies could be extemporized in the event of hostilities, but neither fleets nor guns could be. An invasion would not be required for the United States to suffer defeat. With over three millions of population and two billion dollars in property in its harbors, the country could not afford to be without defenses. The editorial continued, pointing out that the oceans on which the country depended for defense were really no protection, for U.S. harbors lay only thirty-six hours from British naval bases in Halifax and only six hours from Spanish bases in Havana. The Navy was a poor solution because of its expense. Meanwhile, as America delayed putting her defenses in order, her foreign policy was crippled; her most urgent diplomacy was only "an empty expression of opinion" since she could not back her words with force.<sup>19</sup>

Congressional appropriations for ordnance and fortifications were meager during the period 1880-1885. Sometimes they were adequate to maintain the antiquated coast defenses, while at other times even that was difficult; there was almost no money available for the Ordnance Department to begin experimenting with the new technology. Annual appropriations were \$100,000 in 1880, \$175,000 from 1881 to 1883, and a little over \$700,000 in 1884 and 1885, while the Chief of Engineers was annually requesting more than \$3,000,000.<sup>20</sup>

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<sup>18</sup>NYT, 11 December 1881, p. 8.

<sup>19</sup>Ibid., 12 November 1881, p. 4.

<sup>20</sup>Ibid., 27 January 1882, p. 1, and 25 December 1882, p. 1, and 14 January 1882, p. 5, and 1 July 1884, p. 1, and SAL 21: 109: 80, 21: 468: 135, 22: 93: 172, 22: 471: 96, 23: 158: 235, 23: 434: 345.

The coastal cities and their representatives increasingly criticized Congress for its failure to provide adequate coastal defenses. The preference of interior legislators for "pork barrel" projects benefitting their home districts over improved coastal defenses came in for specific criticism. In January 1882, Congress voted \$10,000,000 for river and harbor improvements but only \$175,000 for coast defense. During debate on the floor of the House, a Pennsylvania representative reflected the prevailing mood, saying that his constituents did not want fortifications but "liberal appropriations for rivers and harbors." At this the New York Times editorial writer waxed virulent. The "so-called defenses" were outmoded and war could be forced on the United States because of the unprotected riches of her coastal cities, yet legislators could gain expenditures for them only as public works projects.<sup>21</sup> He sarcastically added the following day that Alaskan harbors were better defended than New York because the coast was rougher and not as well-charted.<sup>22</sup>

In the annual reports of the chiefs of ordnance and engineers for 1882, both generals proposed that legislation be passed to allow a start on modernizing the coast defenses. General Stephen Vincent Benet, the keenly intelligent officer with a genuinely scientific bent who was chief of ordnance from 1874 to 1891, asked for funds to begin experimentation with heavy ordnance so that production could commence when the best design was determined. He pointed out that if the Ordnance Department were given even limited funds, it could make preparations for later U.S. production; if not, the country would sooner or later find itself dependent on foreign manufacture.<sup>23</sup> General Wright, the chief of engineers who had also been

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<sup>21</sup>NYT, 23 January 1882, pp. 1, 4, and 25 January 1882, pp. 1, 4.

<sup>22</sup>Ibid., 26 January 1882, p. 4.

<sup>23</sup>NCAB, vol. 30, pp. 446-447, and NYT, 27 October 1882, p. 2.

wrestling with the problem for years, criticized the nation, and by implication Congress, for its lack of foresightedness. "It is believed," he said, "that there is hardly any civilized nation so ill-prepared for war, as far as maritime defenses are concerned, as the United States."<sup>24</sup>

When the Congressionally-appointed Gun Foundry Board prematurely announced its recommendations to the New York Times in advance of its formal report in November 1883, the specific weaknesses in the development of ordnance in the United States were outlined to the world. The Board had inspected all the gun-making industries of Europe except the Krupp works in Germany, where they were refused. The members concluded that "nothing in the country [U.S.] in the shape of ordnance can compare with anything on the other side."<sup>25</sup> The board recommended against use of Bessemer process steel (the primary process then in use in the United States) in favor of crucible steel, flatly rejected any design except breech-loading, and recommended the establishment of a national (i.e. government) gun foundry to make the same type guns for both the Army and Navy.<sup>26</sup> If these steps were taken, the board concluded, "the lack of an appropriation [will be] the only thing that will stand in the way of the production of good guns."<sup>27</sup>

President Arthur prodded Congress for the third time in his annual message a month later, on 4 December 1883:

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<sup>24</sup>NYT, 28 October 1882, p. 6.

<sup>25</sup>Ibid., 1 November 1883, p. 3.

<sup>26</sup>When it became apparent that different types of guns would be required for coast defense than for ships, this provision was modified to allow for both Army and Navy gun factories. NYT, 18 February 1884, p. 5, and 23 December 1884, p. 3.

<sup>27</sup>NYT, 1 November 1883, p. 3.



I again call your attention to the present condition of our extended seacoast, upon which are so many large cities whose wealth and importance to the country would in time of war invite attack from modern armored ships, against which our existing defensive works could give no adequate protection. Those works were built before the introduction of modern heavy rifled guns into maritime warfare, and if they are not put in an efficient condition we may easily be subjected to humiliation by a hostile power greatly inferior to ourselves. As germane to this subject, I call your attention to the importance of perfecting our submarine-torpedo defenses. The board authorized by the last Congress to report upon the method which should be adopted for the manufacture of heavy ordnance adapted to modern warfare has visited the principal iron and steel works in this country and in Europe. It is hoped that its report will soon be made, and that Congress will thereupon be disposed to provide suitable facilities and plant for the manufacture of such guns as are imperatively needed.<sup>28</sup>

But with respect to the Army, Congress would not soon heed the guidance of the President and the Gun Foundry Board.

Earlier in 1883, Congress had taken action to provide the beginnings of a modern navy. In the Naval Appropriation Act of that year (which also established the Gun Foundry Board), Congress authorized the Navy to build three steel cruisers, the first keels laid down since the Civil War.<sup>29</sup> With what would become the "White Squadron" of later fame already being built, Congress would have been expected to be more willing to accept recommendations of the Gun Foundry Board with respect to the Navy, for the cruisers could not be launched unarmed. Nonetheless, purely political factors caused problems in the matter of appropriations for the military in 1884. That year Arthur, a Republican, was filling the last year of his term in office; Democrats, who controlled the House, appeared reluctant to vote funds for projects which would contribute to a Republican success in the elections that year. The President took the step, unusual for the time,

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<sup>28</sup>Messages and Papers, vol. 10, pp. 4767-4768.

<sup>29</sup>SAL, 22: 472-481: 97. Weigley, The American Way of War, p. 169.

of sending a special message to both houses of Congress asking for passage of a permanent annual appropriation for modern armament to install in the fortifications.

The condition of our seacoast defenses and their armament has been brought to the attention of Congress in my annual messages, and I now submit a special estimate of the Chief of Ordnance, United States Army, transmitted by the Secretary of War, for a permanent annual appropriation of \$1,500,000 to provide the necessary armament for our fortifications.

This estimate is founded upon the report of the Gun Foundry Board recently transmitted, to which I have heretofore invited the early attention of Congress.

In presenting this estimate I do not think it necessary to enumerate the considerations which make it of the highest importance that there should be no unnecessary delay in entering upon the work, which must be commensurate with the public interests to be guarded, and which will take much time.<sup>30</sup>

But both the Navy and Army had to wait for resolution of their problems until the voters decided the Presidential election. Representative Samuel Randall, the powerful Democrat of Pennsylvania engineered the defeat of the proposed appropriation for fortifications, at least according to the New York Times, because it would contribute to the success of the Republican Party. "The most serious obstacle to obtaining [the cruisers]" the Times continued, "is the mischievous political methods of the administration which must build them."<sup>31</sup> Randall also succeeded in defeating a three million dollar appropriation bill for the fortifications in committee and substituting his own \$600,000 bill. Even without Randall's effectiveness in committee it is unlikely that the larger bill would have passed, for the pacific sentiments of the Democrats were impressive, and they were the majority party. As one speaker, William S. Holman, a Democrat from Indiana said, "Providence has made it possible for this nation to ignore the methods

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<sup>30</sup>2 April 1884; Messages and Papers, vol. 10, p. 4798.

<sup>31</sup>NYT, 2 July 1884, p. 4.

of the Old World, which it was now proposed to copy."<sup>32</sup> Other speakers cited the absence of indications of war and the faith that the people of Europe were in sympathy with the people of America; in the unlikely event of war, defenses could be improvised.<sup>33</sup> Representative Abram Hewitt, later the Democratic mayor of New York, might have been expected to favor spending on coastal ordnance as he was both a coastal representative and a steel-maker. Nonetheless, he opposed the bill, not because he thought new guns were completely unneeded (although he observed that there was no threat on the horizon), but because he thought the United States should wait for the best gun design before voting funds to build them; he did not say that Democratic steel-makers could better serve the nation than Republican ones.<sup>34</sup> Not surprisingly, he did not renew his opposition during the next year when the Democrats controlled both the Presidency and the House.<sup>35</sup>

The party platforms of 1884 were little concerned with military policy as an issue. The Democratic platform primarily concerned itself with honesty in government and tariff reform; its only plank touching on defense was an allusion to the Republicans squandering money on a Navy that was still nonexistent. The Democrats opposed entangling alliances and, by implication, Pacific expansion, since they ridiculed the Republican purchase of Alaska. The Republicans were only a little less isolationist, opposing foreign

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<sup>32</sup>Ibid., 1 July 1884, p. 1.

<sup>33</sup>Ibid.

<sup>34</sup>NYT, 2 July 1884, p. 4, and Wheeler Preston, American Biographies (New York: Harper & Bros., [1940]), p. 475.

<sup>36</sup>Composition of 48th Congress (1883-1885): House: D197, R118; Senate: R38, D36; 49th Congress (1885-1887): House: D183, R140; Senate, R43, D34. Webster's Guide, p. 776.

alliances but for peace and world trade. They supported a strong Navy, but did not mention coast defense.<sup>36</sup> Grover Cleveland, the Democratic nominee won the election, over James G. Blaine, the Republican.<sup>37</sup>

In his annual message as a lame duck, President Arthur made his strongest and most detailed appeal for appropriations for ordnance and coast defense.

The Secretary of War submits the report of the Chief of Engineers as to the practicability of protecting our important cities on the seaboard by fortifications and other defenses able to repel modern methods of attack. The time has now come when such defenses can be prepared with confidence that they will not prove abortive, and when the possible result of delay in making such preparation is seriously considered delay seems inexcusable. For the most important cities--those whose destruction or capture would be a national humiliation--adequate defenses, inclusive of guns, may be made by the gradual expenditure of \$60,000,000--a sum much less than a victorious enemy could levy as a contribution. An appropriation of about one-tenth of that amount is asked to begin the work, and I concur with the Secretary of War in urging that it be granted.<sup>38</sup>

He went on to recommend that prompt action be taken to provide continuing appropriations over a period of years to implement the recommendations of the Gun Foundry Board. American steel companies had indicated that they could furnish the required forgings; however, the costs of facilities and equipment for the new technology were extremely high. This meant that the steel manufacturers must be assured of continued contracts over a long period before they could make the investment.<sup>39</sup>

That Congress was undecided as to what measures to approve for coast defense in the early 1880's is not entirely surprising, given the ambiguity of the very term "coast defense," the lack of consensus between

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<sup>36</sup>Porter, National Party Platforms, pp. 117, 120, 122, 135.

<sup>37</sup>Webster's Guide, p. 768.

<sup>38</sup>Messages and Papers, vol. 10, p. 4833.

<sup>39</sup>Ibid., pp. 4833-4834.

the army and navy, or even within the army on what measures to recommend, or within the executive branch concerning a credible threat to the coasts. Appointment of boards to study problems became, for Congress, an attractive alternative to taking action on thorny issues. Such a board took the onus for recommending a course of action out of the realm of partisan and regional politics and gave the final recommendation an imprimatur of expert authority; additionally, it gave a reason for Congressional inaction for the year or more that the board was collecting its data and making its report. By 1885, Congress was ready to appoint a board to examine the coast defense problem.

The bill providing funds for the fortifications for fiscal year 1886 became law on 3 March 1885. It provided \$725,000 for the defenses, but more importantly, it required the President to appoint a board to "examine and report at what ports fortifications or other defenses are most urgently required, the character and kind of defenses best adapted for each, with reference to armament [and] the utilization of torpedoes, mines, or other defensive appliances . . . ." Congress specified the composition of the board to be the Secretary of War, two engineer officers, two ordnance officers, two naval officers, and two civilians. The act gave President Cleveland his first opportunity to move in providing improved coast defenses.

On 12 May 1885, President Cleveland announced the composition of the board:

Hon. William C. Endicott, Secretary of War, president of the board; Brigadier-General Stephen V. Benet, Chief of Ordnance; Brigadier-General John Newton, Chief of Engineers; Lieutenant Colonel Henry L. Abbot, Corps of Engineers; Captain Charles S. Smith, Ordnance Department; Commander W. T. Sampson, United States Navy; Commander Caspar F. Goodrich, United States Navy; Mr. Joseph Morgan, Jr., of Pennsylvania; Mr. Erastus Corning, of New York.<sup>40</sup>

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<sup>40</sup>Ibid., p. 4899.

President Cleveland had selected William Crowninshield Endicott (1826-1900) to be his Secretary of War in February 1884. Member of a patrician New England family, Endicott was graduated from Harvard Law School in 1850 and had been a Democrat since the breakup of the Whig Party in 1856. He ran unsuccessfully for the office of attorney-general in Massachusetts in 1866, 1867, and 1868, and for Congress in 1870, when he was defeated by Benjamin F. Butler. Although a Democrat, the Republican governor of Massachusetts named him to the bench in 1873 because of his high reputation, untainted by the sordid machine politics of the era. After being defeated in the race for governor of Massachusetts in November 1884, Endicott's reputation as a man of competence and integrity brought him to Cleveland's attention. As Secretary of War, Endicott proved an exception to the others of the period, distinguishing himself, as Elihu Root observed in 1900, "by strict attention to duty and a keen interest in the army and its requirements."<sup>41</sup> Because of his leadership, the board would become popularly known to contemporaries and to history as "The Endicott Board."

Stephen Vincent Benet (1827-1895) had been the chief of ordnance of the U.S. Army since 23 June 1874. He was the descendant of a Minorcan family which had settled in Florida in the late eighteenth century. As the first cadet to be appointed to West Point from the new state of Florida in 1845, he graduated third in his class in 1849. Commissioned a brevet second lieutenant of ordnance, he served in a variety of technical assignments before returning to West Point as an assistant professor in geography, history, and ethics in 1859 and later as instructor in ordnance and gunnery during the Civil War. There Benet experimented with guns designed by Robert P. Parrott. The Parrott gun of Civil War fame was an effective muzzle-loading

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<sup>41</sup>NCAB, vol. 2, p. 406; DAB, vol. 6, pp. 158-159; Root quote, p. 159.

cannon constructed with a cast-iron barrel reinforced with a wrought iron band around the breech; the guns proved to be some of the most accurate of their period. Benet had been a member of the unheeded earlier board which had recommended improvements in the coastal defenses in 1869. His was a particularly fortuitous choice for the Endicott Board owing to his technical expertise and reputation in ordnance matters.<sup>42</sup>

The senior officer of engineers on the Endicott Board was John Newton (1823-1895), a Brigadier-General and chief of engineers. He had graduated second in the class of 1842 at West Point, along with many individuals of later fame such as James Longstreet, Earl Van Dorn, William Rosecrans, and John Pope. Before the Civil War he was continuously engaged in engineering work on lighthouses, fortifications and river and harbor improvement, except for a stint as instructor at West Point. Although a Virginian, Newton had remained with the Union Army and performed heroically during the Civil War as the engineer in charge of the Washington defenses early in the war. Later he served as a commander of a division at Fredericksburg, Chancellorsville, and Gettysburg. At Gettysburg, Meade selected him to command I Corps when General John Reynolds was killed. During the last year of the war he commanded a division under Sherman through the Atlanta campaign and then became commander of the District of West Florida until the end of the war. His greatest fame, however, rested on his post-war activity in improving New York harbor by opening Hell Gate channel with two explosions of dynamite of 50,000 and 200,000 pounds which his biographer described as "two of the most remarkable achievements in engineering science, of their character, known to history."<sup>43</sup> He was probably the best qualified officer

<sup>42</sup>NCAB, vol. 30, pp. 446-447; Parrott gun data from Ian V. Hogg, A History of Artillery (London: Hamlyn, [1974]), pp. 56, 61.

<sup>43</sup>NCAB, vol. 4, pp. 312-312, quote, p. 313; DAB, vol. 8, pp. 473-474, and Mark Mayo Boatner, The Civil War Dictionary (New York: David McKay Co.,

available to advise the board on matters relating to the construction of harbors and fortifications.

The junior officers of ordnance, Charles Sidney Smith (1843-1922) and engineers, Henry Larcon Abbot (1821-1927) who served on the board were never to achieve the fame of the senior officers of those branches on the board. Smith had graduated from West Point in 1866, Abbot in 1854.<sup>44</sup>

Both the naval officers who served on the Endicott Board were distinguished choices. William Thomas Sampson (1840-1902) and Caspar Frederick Goodrich (1847-1925) had both graduated at the head of their classes at the Naval Academy, Sampson in 1861 and Goodrich in 1864. Sampson saw service in the Civil War, and was on the turret of the monitor Patapsco in 1865 when it was blown out of the water with the loss of sixty lives, while removing mines in Charleston harbor. During service as an instructor at Annapolis, Sampson gained a reputation of outstanding proficiency in the physical sciences relating to naval affairs. During the period of his service on the Endicott Board, Sampson was also commander of the Newport Torpedo Station. He would later become superintendent of the Naval Academy and then of the naval gun foundry. Sampson would attain disputed recognition in the Spanish-American War by being selected over senior officers to command the squadron which would blockade Cuba. Although his squadron was to destroy the Spanish squadron outside Santiago harbor on 3 July 1898, a largely political controversy would ensue as to whether Sampson or Winfield Scott Schley, the second in command, was responsible for the victory.<sup>45</sup>

Caspar Goodrich, the younger officer, had seen no service in the

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Inc., [1959]), pp. 490, 593, 658, 659, 708, 867.

<sup>44</sup>Who Was Who in America, 1897-1942, pp. 1, 1138.

<sup>45</sup>DAB, vol. 16, pp. 321-323.



Civil War, but had been naval attache with the British fleet during the bombardment of Alexandria in 1882. He was thus uniquely qualified concerning ship versus shore gun duels. He was an expert in naval ordnance, having served as inspector at the Washington naval yard until his appointment to the Endicott Board.<sup>46</sup>

The two civilian members of the board were both steel manufacturers who could evaluate American capabilities in comparison with foreign gun foundries which the members would visit. One of them, Erastus Corning, was the son of a Democratic politician who had founded the Albany Iron Works and been active in the development of New York railroads. The younger Corning was the president of the Albany and Rennsalaer Iron and Steel Works, and a personal friend of President Cleveland.<sup>47</sup>

Given the range of topics which they were to examine and the comprehensive nature of their charge, the board's task was monumental; they turned at once to their work and organized committees to examine functional components of coast defense in the United States and in foreign countries. They first met in June 1885 and named committees to examine and report on conditions in the United States and abroad regarding steel armor and guns, torpedoes, capabilities of foreign warships, and the development of the United States steel industry.<sup>48</sup> The board inspected defenses and gun production facilities in the United States and abroad through the rest of the year. The members met with cooperation in all countries except Germany, where Alfred Krupp, by that time making guns for Germany and many smaller nations, offered to sell guns to the United States, but refused to let the

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<sup>46</sup>NCAB, vol. 13, pp. 76-77.

<sup>47</sup>NYT, 31 August 1897, p. 7.

<sup>48</sup>NYT, 4 June 1885, p. 3.

committee into his factory.<sup>49</sup> The board completed its work quickly and thoroughly, and the report was ready for publication by the end of the year.

During the time the Endicott Board was doing its work, there was an increasing interest in the question of coast defense in the press. On the day after the New York Times reported the appointment of the board,<sup>50</sup> it gave detailed coverage of an address entitled "Our Seacoast Defense" delivered on 14 May 1885 before the Military Service Institute. In this presentation the speaker, an Army lieutenant, dramatized the uselessness of antiquated and outmoded forts by pointing out that in New York there were eight buildings alone worth twelve million dollars, within gunshot of naval positions off Governor's Island. With British and Spanish naval stations located from one to four days steaming from New York, he saw the defenselessness of the city as absurd. In his view, the Navy, even augmented by torpedoes (i.e. mines) and improvised earthworks, would provide an entirely inadequate coastal defense. Joseph N. Dolph, a Senator from Oregon since 1883 was present, and, according to the newspaper report, was impressed by the address; in the years to come he would be a perennial advocate of spending for coast defenses.<sup>51</sup>

In the course of its investigations, the Endicott Board soon found the American iron and steel industry willing to cooperate in providing

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<sup>49</sup>Moncure D. Conway, "An Iron City Beside the Ruhr," Harper's New Monthly Magazine, March 1886, pp. 495-518 passim, and NYT, 18 July 1885, p. 2.

<sup>50</sup>The New York Times reported the appointment of the Endicott Board on 14 May 1885, p. 2.

<sup>51</sup>NYT, 15 May 1885, p. 8. Near the end of May, the San Francisco Bulletin interviewed Major General John Pope, who agreed with the sentiments expressed at the Military Service Institute. In his opinion, torpedoes as they then existed were too complex to be fully relied on in wartime. NYT, 31 May 1885, p. 2.

ingots and forgings for government gun factories. However, the manufacturers would need contracts of one to two million dollars per year, as the plant costs associated with the project would be between two and three million dollars per plant.<sup>52</sup> The South Boston Iron Works offered to supply finished guns, estimating that they could construct five twelve-inch breech-loading rifles in one year, along with one hundred twelve-inch mortars or twenty ten-inch breech-loading rifles.<sup>53</sup>

In December of 1885, before the Endicott Board made its report, the political waters were muddied from an unexpected source. In a move that would cause the motives of proponents of improved fortifications to be in question for years, Samuel J. Tilden, the unsuccessful Democratic presidential candidate in 1876, wrote a long letter to Congress recommending improved coast defenses.<sup>54</sup> Almost immediately the recommendation was attacked as inspired by ulterior motives. The New York Times at first editorialized that the letter was simply party politics: "the political control having passed into Democratic hands, he is no longer anxious . . . lest the nation be launched into extravagant expenditures . . . he has suddenly waked up to the defenceless condition of our seacoast."<sup>55</sup> But a few days later another editorial reported that Washington papers were saying that Tilden had a

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<sup>52</sup>Ibid., 18 July 1885, p. 2, and 28 October 1885, p. 2, and 18 November 1885, p. 2.

<sup>53</sup>Ibid., 19 November 1885, p. 8. Given the later experience of both the South Boston Iron Works and the government in making guns, such an estimate was almost certainly overly optimistic; nonetheless, the Army might have been better off in the long run to accept the offer and get the Congressional lobbying effort of the steel industry in the bargain.

<sup>54</sup>NYT, 5 December 1885, p. 5; Tilden's letter is dated 1 December 1886. The text is also in U.S., Congress, House, Congressional Record, v. 17, 49th Congress, 1st sess., pp. 7100-7101.

<sup>55</sup>NYT, 5 December 1885, p. 4.

darker motive; he was advocating big increases in steel production to secure profits for his friends in the steel industry.<sup>56</sup> Whether Tilden was sincere in his concern for the security of the country cannot be determined. Given his character and temperament, the historian can give him the benefit of the doubt; his biographers are silent on the issue. What is certain is that Tilden had a moderate fortune in iron mining and manufacturing; he owned large interests in eight iron and steel companies.<sup>57</sup> The allegation that his financial interests or those of his friends had motivated his letter was to be repeated again and again. Tilden had, probably inadvertently, created a skeptical political atmosphere for the report of the Endicott Board.<sup>58</sup>

The Endicott Board published its comprehensive report in January 1886, less than a year after its appointment. The problem facing the country was immense and discouraging, as might have been expected after almost a generation of neglect. Not only were the fortifications hopelessly inadequate, there was no navy "worthy of the name." Thus, in addition to protecting harbors of major commercial importance, the board was forced to recommend the fortification of a number of smaller harbors where the merchant marine could take refuge in the event of war.<sup>59</sup>

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<sup>56</sup>NYT, 7 December 1885, p. 4.

<sup>57</sup>Alexander Clarence Flick, assisted by Gustav S. Lobrano, Samuel Jones Tilden: A Study in Political Sagacity (New York: Dodd, Mead & Co., 1939), pp. 508-509.

<sup>58</sup>For example, when the fortifications bill was debated in 1888 and some Senators were holding out for private manufacture of cannon, the New York Times assumed that those inspiring the delay were the "prominent men" who had inspired Tilden's letter. NYT, 9 August 1888, p. 1. Tilden died shortly after sending the letter.

<sup>59</sup>"The Taft Report," p. 10 (Commenting on the Endicott Report).

Throughout the report there ran a depressing tone of sombreness combined with a sense of urgency which fosters in the reader an awareness of the probable situation at the beginning of a war against great odds:

It is of no advantage to conceal the fact that the ports along our sea-coast--a length of about 4,000 miles, not including Alaska--invite naval attack; nor that our richest ports, from their greater depth of water and capacity to admit the largest and most formidable armored ships, are of all the most defenseless.

The property at stake exposed to easy capture and destruction would amount to billions of dollars, and the contributions which could be levied by a hostile fleet upon our sea-ports should be reckoned at hundreds of millions.

It is impossible to understand the supineness which has kept this nation quiet--allowing its floating and shore defenses to become obsolete and effete--without making an effort to keep progress with the age, while other nations, besides constructing powerful navies, have not considered themselves secure without large expenditures for fortifications, including armored forts.<sup>60</sup>

The report recommended the expenditure of \$21.5 million the first year and approximately \$9 million annually thereafter until completion of the projects (in 1900, if the bill had passed in 1886) at a cost of \$126,377,800.<sup>61</sup> The board recommended immediate attention to eleven ports considered vital to the United States (beginning with New York) and later work to improve sixteen additional less important harbors.<sup>62</sup>

Coast defenses were pictured as having a deterrent effect on war, as undefended ports were a temptation to exploitation:

In the mean time [since 1860] we have acquired great riches and apparently dreamed that prosperity should inspire friendship and not envy in less favored peoples--forgetting that riches are a temptation, and that plunder of one of our sea-ports might abundantly reimburse an enemy for the expenses of a war conducted against us.<sup>63</sup>

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<sup>60</sup>"The Endicott Report," p. 6.

<sup>61</sup>Ibid., pp. 28-29.

<sup>62</sup>Ibid., p. 8.

<sup>63</sup>Ibid., p. 6.

The Endicott Board agreed with and repeated the recommendations of the Gun Foundry Board concerning the establishment of national arsenals as gun factories, carefully outlining developments in cannon, projectiles, propellant and armor in an attempt to convince doubting legislators that a technological revolution had occurred.<sup>64</sup> The report condemned the purchase of foreign steel (although later, individuals in the War Department were to recommend buying foreign guns to avoid delay in protecting vital points)<sup>65</sup> and recognized the critical role Congress would play in the purchase of steel:

It cannot be expected that even the richest and most flourishing of our steel works, with millions of capital, to uphold it, will venture such an amount of money in plant, merely in the doubtful hope that the Government may give a contract sufficiently large to save it from loss. . . .

Business men know that the action of one Congress does not control the action of subsequent Congresses, . . . there is no certainty as to the future, and the risk is far greater than the chances of profit. . . .<sup>66</sup>

The board felt that an effective defense would require what, in twentieth century parlance, would be called an array of weapon systems to be effective as a deterrent and as a weapon. That is, the coast defenses must comprise a mix of weapons, each performing a specific role in defeating any attacker. Experimentation with other than steel guns was discouraged. Rifled guns of eight, ten, twelve, and sixteen inches were recommended with the completion of their manufacture projected for 1918.<sup>67</sup> The use of

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<sup>64</sup>Ibid., pp. 6, 11, 264, and F. V. Greene, "Our Defenceless Coasts," Scribner's Magazine 1 (January 1887): 65.

<sup>65</sup>"The Endicott Report," pp. 25-26, 28, and U.S., Ordnance Department, Annual Report of the Chief of Ordnance to the Secretary of War for the Fiscal Year Ended June 30, 1886 (Washington, D.C.: War Department, 1886), p. 2.

<sup>66</sup>"The Endicott Report," pp. 26-27.

<sup>67</sup>Ibid., p. 10 and Captain John E. Greer, "Recent Developments in Gun-making," The Cosmopolitan 8 (December 1889): 400, and U.S., Ordnance Department, Annual Report of the Chief of Ordnance to the Secretary of War for the Fiscal Year Ended June 30, 1890 (Washington, D.C.: War Department,

torpedoes, floating batteries of cannon, mines covered by searchlights, and mortars in conjunction with the heavy guns on disappearing carriages would make a system in which each element contributed to the total defense.<sup>68</sup>

In an attempt to demonstrate what might be called the "cost effectiveness" of the defense plan, the report analyzed population, property, and costs of the harbors and their projected defenses:

A comparison can now be made of the estimates for modern works with those made in 1840, . . . The population of the country at that time was 17,000,000, and the estimate cost, including the amounts already expended, was \$57,131,541, being at the rate of \$3.35 per head.

The population in 1880 was 50,000,000, and the estimate for the coast defense is \$126,377,800, at the rate of \$2.52 per head.

The valuation of property in 1880 was \$43,642,000,000; that of 1840 was about \$4,000,000,000, and it is to be seen that the ratio of the estimate for defenses to the country at the present time exhibits a still more favorable comparison.<sup>69</sup>

Members of the board clearly recognized that they were recommending measures which were beyond the "state of the art" in development and that were beyond the American industrial capability of the day; for these reasons they emphatically recommended an immediate start on the diverse projects envisioned. Time was as critical a factor as money, and money could not substitute for time. The Gun Foundry Board had estimated that it would take at least three years to make required improvements at the civilian foundries and to establish government factories, then two more years before the first sixteen-inch gun could be completed. The Endicott Report therefore recommended that work be started in the meantime on the gun emplacements and other related items of equipment so that no delay would occur in mounting

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1890), pp. 12-13.

<sup>68</sup>"The Endicott Report," pp. 9, 10, and 67 ff.

<sup>69</sup>Ibid., pp. 28-29.

the guns when completed.<sup>70</sup>

Before Congress could be persuaded to appropriate moneys for coast defenses, the lawmakers and their constituents across the nation had to be convinced that there was both a deficiency in the standing defenses and some palpable threat to the coasts. This was not an easy task, although coastal inhabitants had felt for some time that their cities faced a variety of potential threats. Beginning about 1885, well-written articles in both the popular and scholarly journals of the day explored every facet of the problems of coast defense. An unsigned article entitled "The Defense of Our Seaports" in Harper's New Monthly Magazine for November 1885 is a good example. In it, the author gave a detailed but non-technical exposition of the improvements in artillery and warships since the Civil War.<sup>71</sup> He then justified expenditures for coast defenses in times of peace by saying:

Today the horizon is without a cloud, and we have at least the apparent friendship of nations. The policy of non-interference in the political affairs of the Eastern continent is bred into our very bone; but side by side with it has grown a no less fixed determination to have a controlling voice in the affairs of this continent. Fair as is now the prospect, what conscientious student of the past could guarantee the certainty of peace even for the next six months, . . . Common sense dictates that we credit other nations with at least some small modicum of military enterprise and ability, especially when we invite the attack by our weakness.<sup>72</sup>

The author continues, quoting the chief of engineers as saying that there would be no defense possible were New York City attacked by "even a second-rate European naval power."<sup>73</sup> He concludes by observing that economy is

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<sup>70</sup>*Ibid.*, p. 6.

<sup>71</sup>"The Defense of Our Sea-Ports," Harper's New Monthly Magazine 71 (November 1885): 928-935; see also, for later examples, Greene, "Our Defenceless Coasts" and Griffin, "Our Sea-Coast Defenses."

<sup>72</sup>"The Defense of Our Sea-Ports," p. 928.

<sup>73</sup>*Ibid.*, p. 937.



commendable, but that should a man who lived in a neighborhood infested with burglars refuse to spend the money for a lock for his front door, he "would [not] be generally considered a very striking example of that virtue."<sup>74</sup>

As might be expected, the New York Times quickly endorsed the Endicott Report and several articles reported on its findings and urged action. On 6 January 1886, an article described the recommended expenditures for coast defenses as large, but since their implementation had been postponed for twenty years, not excessive. In its view, there could be no reason for delay as the dependence of foreign markets on American grain and cotton was no longer a deterrent to war, and there would be no time to improvise defenses if war came.<sup>75</sup> Later an editorialist made a strong case for Congress to pass a large appropriations bill for improved ordnance. Congress now has the required information, he said, and it should act. The plethora of agencies studying the question--the Gun Foundry Board, the Senate Select Committee on Ordnance and Guns--had all completed their analyses and there should be no recourse to yet another group to look at the problem. In addition to the various study groups, the nation's soldiers and civilians, both political parties and both houses of Congress all agreed on what needed to be done: establish two gun factories and begin to make modern steel weapons in the United States.<sup>76</sup> But the recommendations and arguments of the boards and the editorialist were to fall on deaf ears in the House of Representatives.

In the Forty-ninth Congress, the Democrats controlled the House 183 to 140, while the Republicans controlled the Senate 43 to 34.<sup>77</sup> The Endicott

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<sup>74</sup>Ibid.

<sup>75</sup>NYT, 6 January 1886, p. 6.

<sup>76</sup>Ibid., 5 April 1886, p. 4.

<sup>77</sup>Webster's Guide, p. 776.

Board had recommended spending \$21.5 million during the first year of an extended program of improving the fortifications. Somewhat more realistically, the Army had officially requested only \$3.396 million. In the Fortifications Committee of the House, this was reduced to \$600,000.<sup>78</sup> Several states had already sent resolutions of their legislatures to Congress requesting big expenditures for coast defense. A joint resolution of the Connecticut General Assembly, which passed both Connecticut houses by 29 January 1886, requested that the Congress take action since constitutionally the states could not defend themselves. The resolution continued:

thorough preparation for defensive warfare is essential to the free action of the National Government in dealing with foreign powers. . . . [A] consciousness on our part and a knowledge on the part of the world of our rich and defenseless seacoasts is calculated both to invite aggression and to hamper [effective defensive measures] . . . ; war . . . is certain to come and to come without long warning.<sup>79</sup>

In a more strident tone, the Louisiana General Assembly stated the same theme in a joint resolution of July 1886: the United States was not only without defenses against the first rate powers but even against second and third rate powers such as Spain, Chile, or China, creating a "Humiliating . . . and unbecoming . . . [condition causing] profound anxiety and discontent." The legislature requested appropriations to build a system of coast defense to allow the President the freedom to "assert and enforce [the Nation's] rights and policy," whether against northeast fishermen or violations of the Monroe Doctrine relating to the Isthmian canal or Caribbean islands.<sup>80</sup>

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<sup>78</sup>NYT, 11 July 1886, p. 8.

<sup>79</sup>House Joint Resolution 16, Connecticut General Assembly, entered by Senator Orville H. Platt (R/CT) in U.S., Congress, Senate, CR, 49th Cong., 1st Sess., vol. 17, p. 2864.

<sup>80</sup>U.S., Congress, House, CR, 49th Cong., 1st Sess., vol. 17, p. 6765.

The unexpectedly small recommendation of the House Committee on Fortifications touched off a bitter debate on the floor of the House. The discussion followed an unusual pattern, however, in that proponents of increased spending for coast defenses were vocal, even strident in their demands, while their opponents, probably secure in the knowledge that their side had the votes already, remained silent. In the first speech after introduction of the bill, Representative Benjamin Butterworth, an Ohio Republican lambasted the Congress for its "gross remissness" and for its willingness to trust the defense of our country to the Fourth of July oratorical pyrotechnics and vain boastfulness as to our power and greatness as a people." He said that the bill, in proposing less than one-half of one per cent of the \$123 million which the Endicott Board had recommended, provided "hardly a decent apology for an appropriation." "The meanest power on earth that floats that which serves as a fair apology for a navy" could place New York under tribute in an amount that would "more than pay the cost of girding our whole land with steel and iron." With over five billion dollars in property at stake, the House did not propose even to defend against "decayed and worn out Spain." It must astonish foreign powers, he continued, that the United States felt herself exempt from the wars which beset them. He challenged anyone in the House to rise and "without blushing, assert that there [was] a proper condition of defense along our coastline." If Congress would not provide iron and steel for defense of the United States, flesh and blood would be required sooner or later. Every nation was at peace with the world, he said, on the day before a war. Reaching his peroration, he declared that

[If challenged by Britain], we could adopt a series of resolutions condemning in strong language the outrage, and could also serve notice that as soon as we can establish a plant and manufacture the necessary guns and armament and as soon as we can build armed ships and generally make suitable preparation, England shall hear from us further, and

we may hold her to a rigid accountability.<sup>81</sup>

Other speakers in the House sounded less strident themes. Some speakers cited economy in spending less for defense in time of peace than would be required to make up deficiencies in time of war. One said that coastal cities which pay taxes are justified in demanding protection. Another enumerated 107 wars between 1700 and 1871 which were not declared, and tried to show that the wages which the appropriation would provide would be a valuable public works project. Still another tried to show that coastal defenses were not a regional question, but a national one because of the foreign trade passing through eastern harbors. One Representative likened the situation in the United States to the defenselessness of China when Britain and France forced the opening of her ports.<sup>82</sup> But the speeches were in vain; the bill, providing \$600,000 for coast defense passed the House unamended on 19 July 1886.<sup>83</sup>

When the bill reached the upper house for debate, the Senators proved more receptive regarding the measure. Senator George F. Hoar spoke, as quoted in a later periodical:

Our condition is well known to foreign nations. The absolutely defenseless condition of all our coast is well known abroad. The late

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<sup>81</sup>Ibid., pp. 7098-7101. The support of an Ohio Congressman was probably owing to the fact that the Endicott Report had named the ports of the Great Lakes as fourth in priority to be fortified, after New York, San Francisco, and Boston. "The Endicott Report," p. 8.

<sup>82</sup>U.S., Congress, House, CR, 49th Cong., 1st Sess., vol. 17, pp. 7105-7113.

<sup>83</sup>Ibid., p. 7154. It must be emphasized here that no analysis of voting patterns by party, region, financial interest, etc. is possible because only a few roll call votes (on relatively minor amendments) were taken on coast defense matters. All generalized inferences regarding motives or sectional differences must therefore remain tentative.

Minister of Foreign Affairs in France said to one of our own statesmen, long since, 'How about your defenses? In the intelligence department of our War Office,' said he, 'we have a drawing of every military work of consequence on the whole American coast line, with comments on their strength. There is not a first-class fortification among them all. Do you know how long it takes to build a first-class modern gun?' said the French Minister. The American replied that he did not. Lacour said: 'It takes a whole year. Your cities would be shelled and sacked and laid under tribute while you are creating a navy; and how could you rebuild your fortifications with one thousand-pound shells falling about the ears of your workingmen? Be sure'--now mark this--'Be sure that the defenseless condition of your country is thoroughly well known and commented upon by every power in Europe that would gladly see you humbled, for, as I said, your prosperity is a dangerous menace to all the nations of the Old World except France.'<sup>84</sup>

With little opposition, the Senate approved six million dollars for fortifications,<sup>85</sup> necessitating a conference committee with the House to set the final amount. The conference committee proved unable to reach a compromise, however, as the Senators were unwilling to appropriate less than five million dollars.<sup>86</sup> For the first time, there were no funds at all, even funds to maintain the old fortifications until, at the very least, the next session of Congress.

A depressing tone permeated the annual report of the chief of ordnance for fiscal year 1886. The report did not go into all the subsequent ramifications of the need for coast defenses, saying that the urgency of the requirement for defenses had been so thoroughly discussed that further remarks were unnecessary. However, because of the delays in appropriations for research on and manufacture of ordnance in the United States, the need for guns at critical large seaports would mean that ordnance and armor must be imported.<sup>87</sup>

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<sup>84</sup>Griffin, "Our Sea-Coast Defenses," p. 71.

<sup>85</sup>U.S., Congress, Senate, CR, 49th Cong., 1st Sess., vol. 17, p. 7647, and NYT, 27 July 1886, p. 3.

<sup>86</sup>U.S., Congress, Senate, CR, 40th Cong., 1st Sess., vol. 17, p. 8108, and NYT, 6 August 1886, p. 2.

<sup>87</sup>Chief of Ordnance Report of 1886, pp. 1-2.

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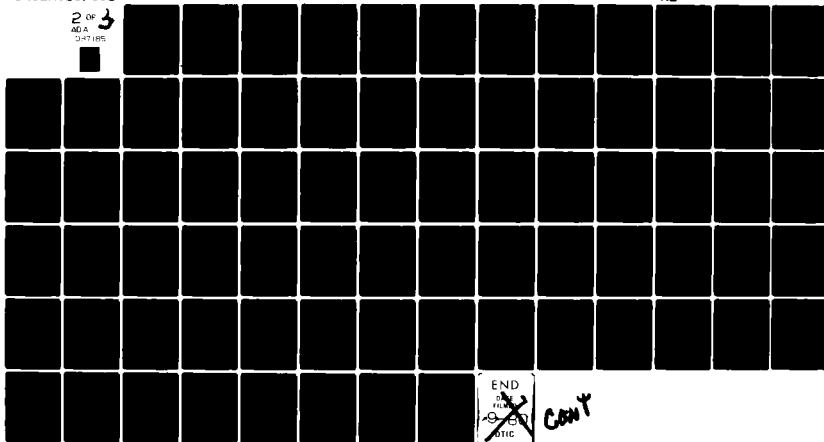
ARMY MILITARY PERSONNEL CENTER ALEXANDRIA VA  
AN ILLUSTRATIVE CASE STUDY FOR TWENTIETH CENTURY DEFENSE PLANNING--ETC(U)  
APR 80 K E HAMBURGER

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The Board cannot state too emphatically that, if the money were now available, three years would be required to provide either the guns or the forts necessary for New York Harbor alone, if we were to go at once to the great private gun and armor establishments of England, Germany, and France. If they were to be obtained in this country a much longer time would be needed. It seems scarcely necessary to say that no naval power which may see fit to attack our seaports is likely to warn us of it three years, two years, or one year in advance.<sup>88</sup>

By the time of the report, construction had stopped at the Army's arsenals and the civilian workers had been discharged; the report speculated that the uncertain employment would make it more difficult to hire skilled workers when Congress did appropriate funds.<sup>89</sup> The ordnance department had been able to test a newly finished eight-inch breech-loading rifle and found it extremely effective and accurate. It had been forced to manufacture the rifle of foreign steel, however, as U.S. steel companies had proved unable to manufacture the high quality steel required.<sup>90</sup> More ominous for the future, however, were reports from two steel companies appended to the annual report. In these appendices, the Midvale Steel Company and the Cambria Iron Company had reported that they had completed their contracts for government ordnance at a loss during the year. The Midvale Steel Company, which had provided the largest forging yet attempted in the United States (for an eight-inch rifle) had failed on a number of castings before it had succeeded in producing a usable end product. The company had thus incurred expenses far in excess of those a commercial venture could sustain.<sup>91</sup> Now both companies looked forward to a year in which there would

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<sup>88</sup>Ibid., p. 3.

<sup>89</sup>Ibid., pp. 8-9.

<sup>90</sup>Ibid., p. 13 ff.

<sup>91</sup>Ibid., Appendix 23, p. 326; also p. 16.

be no funds whatever for ordnance contracts and thus no hope of amortizing their investment facilities, a dismal situation for any industrial concern

Professionals in the Army discussed the issue of coast defenses at length in monographs of the U.S. Coast Artillery School. In a bitter, almost polemical essay, one lieutenant outlined the defenseless state of the nation. He opened with an analogy of New York City depending only on old hand-pumped fire engines as the inhabitants of the city were so intelligent that fire probably wouldn't occur, but if it should, could probably be put out. If, however, high winds fanned the flames higher, the mayor could undoubtedly have enough steam fire engines built quickly and manned by volunteers to control the fire. He then quoted samples of the popular literature which he felt reflected the prevalent absurdity and chauvinism of the national mood; first from InterOcean, a Chicago newspaper:

The fellows that sneer at 'our little army' and our 'old hulk of a Navy' forget that there are 50,000,000 of people behind them. Uncle Sam can move that old flag from the top of the national capitol, or from some peak on the Rocky Mountains, and sound a bugle call, and ships would fall in line and 1,500,000 men would answer "ready."<sup>93</sup>

The writer then went on to quote the Chairman of the House Subcommittee on Fortifications as reported in the Washington Star, 25 January 1886:

The country was in no danger; the moral force of fifty million people was a strong defense . . . The only thing, he said, was they might stand outside the harbor and shell New York, or Boston, or Philadelphia, but the danger . . . was greatly exaggerated, ('shelling don't amount to anything') [sic].<sup>94</sup>

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<sup>92</sup>Ibid., Appendix 24, p. 356.

<sup>93</sup>U.S., War Department, USCAS, Assuming the Present Defenseless Condition of the Seaboard of the U.S., What Military Policy and Action [Should be Adopted], by Solon F. Massey (Fort Monroe, Virginia: USCAS, 1886), p. 1, quote p. 5.

<sup>94</sup>Ibid., p. 5.



In another monograph from the Coast Artillery School, an officer outlined the improved artillery of European nations and said that "in America, subscribing to neither of these enlightened creeds [wrought-iron or steel construction of cannon], we blindly worshiped [sic] at the shrine of so base a metal as cast-iron--a species of idolatry."<sup>95</sup>

On 6 December 1886, President Cleveland sent his second annual message to Congress. Without mincing words, he blamed only Congress for the defenseless condition of the coasts.

The subject of coast defenses and fortifications has been fully and carefully treated by the Board on Fortifications, whose report was submitted at the last session of Congress; but no construction work of the kind recommended by the board has been possible during the last year from the lack of appropriations for such purpose.

The defenseless condition of our seacoast and lake frontier is perfectly palpable. The examinations made must convince us all that certain of our cities named in the report of the board should be fortified and that work on the most important of these fortifications should be commenced at once. The work has been thoroughly considered and laid out, the Secretary of War reports, but all is delayed in default of Congressional action.

The absolute necessity, judged by all standards of prudence and foresight, or our preparation for an effectual resistance against the armored ships and steel guns and mortars of modern construction which may threaten the cities on our coasts is so apparent that I hope effective steps will be taken in that direction immediately.<sup>96</sup>

The Second Session of the Forty-ninth Congress would refuse to provide funds for fortifications as did the first session, although not for lack of public pressure. The session was overwhelmed by petitions from coastal states requesting that Congress provide defenses.<sup>97</sup> On 25 January

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<sup>95</sup>U.S., War Department, USCAS, Changes Wrought in Artillery in the 19th Century . . . etc. by Henry R. Lemly (Fort Monroe, Virginia: USCAS, 1886), p. 5.

<sup>96</sup>Messages and Papers, vol. 11, p. 5099.

<sup>97</sup>Among other petitions are those found in U.S., Congress, 49th Cong., 2nd Sess., CR: California (18: 1940), San Francisco (18: 870, 1199, 1603, 1893), Kentucky (18: 597), Maine (18: 1756), Massachusetts (18: 1854, 1988, 2050), New Jersey (18: 598), New York (18: 1391, 1470, 1701, 1734, 1755, 1756, 1854, 1892, 1900, 2099, 2396), Pennsylvania (18: 1174, 1218, 2231, 2301), South Carolina (18: 909).

1887, a long letter from Admiral David D. Porter, the senior officer of the Navy and a hero of the Civil War, was entered in the Congressional Record; in it, Admiral Porter advocated a combination of new naval vessels and strong coastal fortifications to provide for the coast defense of the nation. He compared the headstart that Britain, Germany, and France had over the United States. Although he indeed wanted to see modern guns manufactured in the United States, he felt that the services must buy them from the great European manufacturers to fill their short-term needs. He felt the situation to be humiliating and contrasted the lethargy of the United States with British actions on the Pacific coast.

That beautiful inland sea in Washington Territory, Puget Sound, where already are laid the foundations of a mighty empire, is left entirely unprotected and liable to fall into the hands of any one of the great powers that chooses to take possession.

The fortifications possessed by the United States on Puget Sound are not worthy of the name of forts. Across the straits of Juan de Fuca the English have a navy-yard at Esquimalt, a short distance west of the city of Victoria. Prominent engineer officers of the British army have very recently thoroughly surveyed Esquimalt and Victoria with a view of adding to their already strong defenses. Hardly was the ink dry on the paper which announced this survey than we read of an immense quantity of heavy rifle guns and ordnance . . . of all kinds on their way, . . . to arm the projected forts.

Mark the difference between Great Britain's action and that of the United States, and see how the former stretches her hand out over her possessions, makes the land flourish wherever she owns an acre, extends her protecting arm over every citizen under her flag, and even in the most obscure places, builds forts that can defy force, and maintains a squadron able to defend her citizens.<sup>98</sup>

Admiral Porter's letter and particularly his distinction between defensive policies of the United States and Great Britain point up a significant feature in the history of American defense policies. The United States had been able to maintain its low levels of expenditures for defense

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<sup>98</sup>Letter, David D. Porter to Hon. Frank Lawler in U.S., Congress, House, 49th Cong., 2nd Sess., CR (18: 1066).

against foreign powers (with the exception of the early nineteenth century fortifications) through a fortuitous combination of its geographic position and the preoccupation of her potential enemies with other problems. A prominent twentieth-century historian has pointed out that America was protected by three oceans--the Atlantic, Pacific, and Arctic--from hostile modern powers with potential design on her territory:

the security thus provided was free in the sense that it was enjoyed as a bounty of nature in place of the elaborate and costly chains of fortifications and even more expensive armies and navies that took a heavy toll of the treasuries of less fortunate countries and placed severe burdens on the backs of their people.<sup>99</sup>

America enjoyed the protection of the British navy for her merchant marine without cost.<sup>100</sup> It is easy, however, to place too much emphasis on the "free security" aspect of America's defense in the late nineteenth century. At least as important was the preoccupation of the European powers with affairs in other parts of the world than the Americas. Britain's powerful navy was modernized far more in response to French and Russian naval expansion than as a result of any thought of concerted effort against America; Britain was involved after the mid-1880's in African colonial problems which would culminate in the Boer War, thus also preventing any deep involvement with the United States. Likewise, the other European powers were involved so deeply with continental rivalries that American incidents of a threatening

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<sup>99</sup>C. Vann Woodward, "The Age of Reinterpretation," The American Historical Review 66 (October 1960): p. 2.

<sup>100</sup>Ibid. Figures for military expenditures as a percentage of national income (in 1914, the only year for which comparable figures are available for all countries) give an indication of the significant advantage the United States enjoyed in this regard: United States 0.8%, Great Britain 3.4%, Japan 4.8%, German 4.6%, Russia 6.3%. In the 1880's expenditures in the United States had never exceeded 0.4%. Ibid., pp. 4, 5, quoting Quincy Wright, A Study of War, 2 vols. (Chicago: n.p., 1942), vol. 1, pp. 666-72.

character did not occur to any great degree.<sup>101</sup> For American defense planners, however, the fact that such conflicts were possible with very little warning was inescapable. For them to have failed to warn Congress and the American public of the potential dangers faced in the absence of prudent defensive preparations would have been an abrogation of their responsibilities. Although there were some indications that this era of noninvolvement was coming to an end, it is not surprising that the public and the legislators of the 1880's were reluctant to accept the view that the United States must provide for her defense as other nations did for theirs.

There was a clear and continuous dichotomy in Congress between those legislators from coastal areas, including the Great Lakes, who predominantly favored coast defense measures and those legislators from interior districts who were ambivalent or hostile to the question of coast defense. In the congressional debate on the Fortifications Appropriation Bill in 1884, the international situation and the position of the United States in the world arena had been a prominent subject of discussion. Although lawmakers from the coastal cities had reiterated the themes of preparing for war in time of peace and warning against possible future imbrolios, their counterparts from interior regions were clearly unconvinced.<sup>102</sup> As a later analyst expressed it, ". . . the experiences of the civil conflict had inspired in them a blind confidence in their inventive genius and ability to meet any crisis which might arise."<sup>103</sup> The lack of conviction by lawmakers from the

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<sup>101</sup>European threats of war 1880-1900, see A. J. P. Taylor, The Struggle for Mastery in Europe, 1848-1918 (Oxford: Oxford University Press, [1954]), Chapters 12-17.

<sup>102</sup>See, for examples citations at fn. 32 above.

<sup>103</sup>G. N. Southwick, "Our Defenceless Coasts," North American Review 162 (March 1896): 318.

interior that there was any credible threat to the United States requiring permanent coastal fortifications was to continue from Congress to Congress.

The legislators who opposed appropriations for fortifications left little record of the reasons for their opposition. While the advocates of improved coast defense often recorded pages of speeches, letters, petitions, and other testimony extolling the need for expenditures, there is often no opposition recorded; yet the bills failed passage (or more often, failed to come to a vote) year after year.<sup>104</sup> One of the reasons for the lack of voiced opposition seems to be that the opponents were sure of their majority and saw no need to exacerbate further their political split by entering into active debate. When a strong proponent of coast defenses had challenged anyone in opposition to rise and assert that the coasts were properly defended, there was no response, and no legislator spoke against the bill; yet no funds were appropriated for coast defenses.<sup>105</sup>

The split in support for coast defense spending between coastal and interior congressmen at least partially accounts for the perennially strong

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<sup>104</sup>An exception to the "silent opposition" is the 51st Cong., 1st Sess., when 183 petitions opposed to fortifications were entered into the Congressional Record. 129 were from organizations in interior states, 54 from organizations in coastal states (45 were from New York, New Jersey, North Carolina, and Maine). Unlike the petitions favoring coastal defenses to the 49th Cong., 2nd Sess. (footnote 97, above), however, which were predominantly from State Legislatures, Chambers of Commerce, Boards of Trade, etc., these were mainly from more obscure organizations (peace groups, ministers, Friends, etc.). Numbers of petitioners are seldom recorded.

<sup>105</sup>U.S., Congress, House, Representative Butterworth (R/Ohio) speaking for the Fortifications Appropriation Bill, 17 July 1886, 49th Cong., 1st Sess., Congressional Record (17: 7100). Although the bill failed because of House/Senate conference difficulties (the Senate advocating more funds than the House) the point is that the question of fortifications was not considered important enough to produce compromises. Since committee hearings were not printed and no roll call votes taken, a precise analysis of party/regional biases is not possible.

majority in the Senate favoring coast defense spending and the equally disparate majority in the House rejecting the spending. As contemporary periodicals expressed the situation:

. . . the inherent weakness of the cause of coast defence is Congress. Twenty-one of the forty-five states border on the Atlantic and Pacific Oceans and the Gulf of Mexico, and embrace forty-two, or nearly one-half, of the ninety Senators. But, in the House, the number of sea and gulf districts, within which coast defence operations are contemplated, is comparatively insignificant; and the active, personal interest manifested in coast defence appropriations is correspondingly small. Important as guns and fortifications are at the present juncture, when viewed in a national aspect, they do not appeal to half the Senate and to scarcely as many Representatives as Senators. Compared with the improvement of rivers and harbors, which abound in every Senate state and House district, or with public buildings, the demand for which Congressmen is universal and unlimited, they are altogether a subordinate matter.<sup>106</sup>

. . . it is one thing to spend money for a purpose which yields a quick commercial return; it is another and far harder thing to sink money in insurance which yields no visible return, and against a contingency which millions of people insist on considering too remote to take cognizance of . . . The vast population of the Interior States is much more anxious to see the public money spent for improving their rivers, from which, in spite of the abuses of the river and harbor bill, they see an immediate advantage, than to have it invested in insurance for sea-coast cities.<sup>107</sup>

During the more than two generations of freedom from the threat of foreign invasion, virtually since the end of the War of 1812, it was far easier to see peace extend indefinitely into the future than to concern oneself with imaginary enemies.<sup>108</sup> America's victories over Britain in 1814 and Mexico in 1848 made most of her citizens view themselves as a more potent world power than was warranted by their military forces.<sup>109</sup> Additionally, the

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<sup>106</sup>Southwick, "Our Defenceless Coasts," pp. 326-327.

<sup>107</sup>Greene, "Our Defenceless Coasts," p. 66.

<sup>108</sup>Griffin, "Our Sea-Coast Defenses," pp. 72-73, and Southwick, "Our Defenceless Coasts," p. 317.

<sup>109</sup>Greene, "Our Defenceless Coasts," p. 51.

distinction was not always made between America's relative invulnerability to invasion and the vulnerability of her coastal cities to shelling, ransom, or payment of tribute to a hostile power.<sup>110</sup> Even the Endicott Report had admitted that invasion was not a threat and that, even if it were, fortifications would not remove the possibility of invasion since the length of coastline made it impossible to protect all of it.<sup>111</sup> Once this distinction became clear, political support for improvement of the fortifications slackened throughout the country with the exception of the coastal cities.<sup>112</sup> The result of the disjuncture of support was that Army ordnance research went virtually unfunded from 1884 to 1888.

Congressmen found it hard to grasp the amount of time required to build modern weapons, which was estimated at three years for delivery of cannon purchased abroad, or five years if manufactured in the United States.<sup>113</sup> They were unwilling to accept the fact that the fortifications were entirely outmoded, since, because of the revolution in technology, these fortifications could not be used even to mount the new weapons when they became available.<sup>114</sup>

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<sup>110</sup>Ibid., p. 52, and "The Defense of Our Sea-Ports," p. 928.

<sup>111</sup>"The Endicott Report," p. 7.

<sup>112</sup>Soutwick, "Our Defenceless Coasts," p. 326, and Greene, "Our Defenceless Coasts," pp. 56, 78.

<sup>113</sup>U.S., Congress, House, Annual Report of Ordnance to the Secretary of War for the Fiscal Year Ended June 30, 1886 (Washington, D.C.: War Department, 1886), p. 57.

<sup>114</sup>"The Endicott Report," p. 6, and Chief of Ordnance Report of 1886, p. 7, and U.S., Congress, House, Annual Report of the Chief of Ordnance to the Secretary of War for the Fiscal Year Ended June 30, 1889 (Washington, D.C.: War Department, 1889), pp. 8-10.

Another factor militating against action was the feeling that the ultimate cannon design in terms of efficiency, cost, and reliability had not yet been developed. A persuasive view was that if the United States waited for European countries to perfect the ultimate weapon design and then copied that design, not only could the politicians save the costs of the expensive testing of competing designs, but they would avoid the possible purchase of a weapon which would itself become outmoded in a matter of years.<sup>115</sup> The concept had worked in copying propellants, why not in gun design, they seemed to ask; for isn't copying technology always cheaper than innovating it?<sup>116</sup>

The argument of waiting to copy technology was the most difficult to counter and the most insidious for the professional artillerists. By the mid-1880's, gun design had progressed to a point that if the ultimate cannon design had not been produced, a number of highly serviceable ones had, and few of these were liable to be outmoded in the next generation. Thus the Military Service Institution, a semi-official study group of military officers and civilian manufacturers in 1887 chaired a symposium concerning the status of gun making, which effectively delineated this argument. The built-up, steel forged gun was the pre-eminent artillery design of the time, and guns manufactured along those lines would remain serviceable for the indefinite future (as in fact they did, until after the mid-twentieth century). If Congress waited for the ultimate, perfect design before appropriating funds to build cannons, a gun would never be built for technological

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<sup>115</sup>Griffin, "Our Sea-Coast Defenses," p. 72.

<sup>116</sup>C. F. Goodrich, "Our New Naval Guns," The Century Magazine 40 (September 1890): 668.



improvements would continue forever, even if at a slower pace.<sup>117</sup> But their arguments had no perceptible effect on the legislators, who would ultimately require increasingly palpable hints of foreign threats to prod them to action.

Throughout February and March of 1887, the New York Times followed progress of the appropriation bill in Forth-ninth Congress with eager interest. In January it reported that the New York Chamber of Commerce had passed a resolution calling any further delay in providing coast defenses intolerable.<sup>118</sup> Additionally, a coast defense association of southern cities had been formed to promote suitable legislation.<sup>119</sup> In February editorials remarked that the whole world had known for years that the United States was defenseless, but that the Senate versions of the appropriations bills, approving \$21 million for fortifications would remedy the situation over time.<sup>121</sup> As passed by the Senate, the bill would have authorized eight million dollars to the Army and an equal amount to the Navy to build gun factories, as well as five million dollars to the Army for fortifications. Among House Democrats, however, the suspicion arose that the Republican-controlled Senate was trying to stamp the Democratic Party as the party of extravagances and hurt the chances of tariff reform.<sup>121</sup> In place of the

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<sup>117</sup>U.S., War Department, Office of Chief of Ordnance, Gun Making in the United States, by Roger Birnie, Jr., (Washington, D.C.: Government Printing Office, 1907 [reprint of 1887 ed.]), p. 140.

<sup>118</sup>NYT, 7 January 1887, p. 8.

<sup>119</sup>Ibid., 16 January 1887, p. 5.

<sup>120</sup>Ibid., 1 February 1887, p. 4; 7 February 1887, p. 2; 8 February 1887, p. 4.

<sup>121</sup>Ibid., 5 February 1887, p. 5.

version, the House proposed a total of five million dollars, approving of one gun factory.<sup>122</sup> Compromise proved impossible; when the bill failed, New York Times editorialist called the situation "intolerable and without precedent;" the Constitution, the Times observed sardonically, provided veto power only to the President; it did not provide a separate veto to the House.<sup>123</sup>

General Benet's official report as chief of ordnance for fiscal year 1887 revealed his frustrations:

As Congress again failed to pass the regular appropriation bill for the armament of fortifications . . . the Department has effected but little . . . in direction of providing guns, carriages, powders for coast defense. The limitations . . . have hampered . . . [ordnance testing].

In view of the success thus far attained by our steel makers it is apparent that all that is now required to make it feasible to produce the largest gun forgings . . . in this country is assurance that the outlay for necessary plant will prove remunerative . . . [it is] . . . the vital interest of the whole country that such liberal appropriations be made by Congress from year to year until our utter destitution as to modern guns be relieved, as shall furnish the substantial encouragement and aid that our steel industry demands.

It will cost money; but not more than the loss to the cities of New York and Brooklyn from one day's bombardment . . . Congress should decide, and decide at once . . . Individual interests must yield to the public good.<sup>124</sup>

In referring to "individual interests," General Benet was probably thinking of the controversy which was already beginning to build over whether the government should build guns in its federal factories or contract for firing guns from manufacturers. By 1888, there were a number of companies seeking an opportunity to profit from the expected boom in ordnance manufacture. In 1887, Senator Leland Stanford of California, presumably a friend of the

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<sup>122</sup>Ibid., 22 February 1887, p. 3.

<sup>123</sup>Ibid., 5 March 1887, p. 4.

<sup>124</sup>Chief of Ordnance Report of 1887, pp. 6, 10, and 11.

industry as he was a railroad entrepreneur,<sup>125</sup> had introduced an unsuccessful bill to provide funds for four private gun factories.<sup>126</sup> Future Congresses would have to wrestle with the problem for years.

A primary reason for the failure of the Forty-ninth Congress to provide funds for coast defense was the opposing majorities in the House and Senate. The Democrats controlled the House 183 to 140, while the Republicans controlled the Senate 43 to 34. In the Fiftieth Congress, the parties held control of their respective chambers, but their pluralities dropped to seventeen votes in the House and only two in the Senate.<sup>127</sup> Thus the stage was set for a more compromising attitude; hopefully the House would not insist on tiny and utterly inadequate appropriations, while the Senate would be willing to accept a smaller amount than the members otherwise desired.

The time was right for advocates of coast defense to build a coalition of politicians to pass a bill providing sufficient funds to begin producing modern ordnance and building fortifications. Instead of skillful legislative maneuvering, however, the backers engaged in awkward bumbling that threatened to kill any appropriations bill once again. Senator Joseph Dolph, the Republican from Oregon who would become one of the strongest perennial advocates of coast defense, introduced a bill requesting \$126 million, for coast defenses. The "Dolph Bill" would become a farcical recurring event in future years;<sup>128</sup> it was clearly out of the question for any

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<sup>125</sup>Who Was Who in American Politics, p. 587, and DAB, vol. 17, pp. 501-505.

<sup>126</sup>NYT, 12 February 1886, p. 3.

<sup>127</sup>Webster's Guide, p. 776.

<sup>128</sup>The New York Times editorialized on Senator Dolph's reintroduction of the bill in later years on 9 December 1889, p. 4; 24 December 1891, p. 4; 13 September 1893, p. 4. The editorials were usually sarcastic and talked about how his proposal made the cause of coast defense appear either frivolous or

politician to be able to build a coalition for such an amount, given the composition and mood of Congress. The New York Times correctly observed that the estimate of \$126 million had been the best that the Endicott Board could make in 1885, but that technology had shown that the board had overestimated the efficacy of torpedo boats, an expensive component of the proposed system. What was far more necessary than to appropriate the full \$126 million was to provide for the immediate needs of the country for maintenance of the fortifications; although inadequate, they were the only defense the harbors possessed. After the immediate needs were met, Congress should be able to reach a compromise and appropriate some funds, however small, to begin construction of modern ordnance and fortifications.<sup>129</sup>

In March 1888, the Senate committee on coast defenses, chaired by Senator Dolph, reported the appropriations bill for fortifications to the Senate, observing that the time was propitious for beginning work on the coast defenses. There was a surplus in the Treasury,<sup>130</sup> and the nation's citizens were demanding protection. The committee endorsed the recommendations of the Senate committee on ordnance and war ships that all guns be steel breech-loaders and that armor and projectiles be forged steel. Further, the committee recommended that the guns be fabricated at the Watervliet Arsenal, West Troy, New York, as recommended by the Gun Foundry Board in

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insurmountable, as such an amount was clearly politically impossible to pass in a single session of Congress.

<sup>129</sup>NYT, 7 January 1888, p. 4.

<sup>130</sup>In December 1887, President Cleveland had devoted his entire Annual Message to the problem of the surplus in the Treasury, indicating its contemporary political and economic importance. He had recommended that departmental requests for funding be honored. Messages and Papers, vol. 13, pp. 6058-6087.

1884.<sup>131</sup> Senator Joseph Hawley (R/CT) introduced the bill by stating that the United States could not resist attack even by Japan, China, or Chile, to say nothing of any European power. The guns and fortifications standing on the shores of the nation would kill more friends than enemy in the event of war.<sup>132</sup> But once the introductory rhetoric was finished, the Senate got down to politics.

Politicians looked for possibilities for patronage wherever they could find them in the bill. Senator Arthur Gorman, a Maryland Democrat threatened to resist passage of the bill unless it provided for private manufacture; the New York Times alleged that he was acting as a tool of the steel interests which had inspired Tilden's letter years before.<sup>133</sup> Congressmen were denouncing the Ordnance Department of the Army as the "graveyard of American genius and enterprise" because it refused to test every innovative design an inventor submitted as the answer for American defense.<sup>134</sup> The paper anticipated that the bill would fail as it had the year before; they blamed the expected failure on "men who favor the schemes of 'personal interest' in opposition to the Ordnance Board . . ."<sup>135</sup>

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<sup>131</sup>U.S., Congress, Senate, Reports of Committees of the Senate of the U.S., "Report to Accompany Bill S. 62," 50th Cong., 1st Sess. (1888), Vol. 4, No. 603 (19 March 1888), pp. 1-7, 18-19. The proposal that guns be built at Watervliet Arsenal was, because of possibilities for patronage, more controversial than might otherwise be expected. Kentucky and Pennsylvania delegations strongly supported locating the arsenal in their states. Debate over the location of the arsenal was heated and threatened to kill the bill. U.S., Congress, House, 50th Cong., 1st Sess., CR, vol. 19, p. 7593; also see NYT editorial, 16 March 1888, p. 4.

<sup>132</sup>NYT, 29 June 1888, p. 1.

<sup>133</sup>Ibid., 9 August 1888, p. 1.

<sup>134</sup>Ibid., 30 June 1888, p. 2.

<sup>135</sup>Ibid., 9 August 1888, p. 1.

In the House, sentiment was as mixed as in the Senate. After a two-day parliamentary wrangle concerning which committee should get to sponsor the bill, which one Representative characterized as a political question from which "the country gets absolutely nothing,"<sup>136</sup> debate opened with the same sort of nationalistic rhetoric as it had in the Senate. One New York Republican Representative discussed the British situation in Canada, saying that on Vancouver Island were the best defenses of the Pacific coast; "within sight of American soil the very best cannon which can be constructed in England . . . are placed, and pointed toward American soil."<sup>137</sup> Another New York Republican from Buffalo was less worried. The state of New York, he said, could take care of Canada and its five million population within sixty days of the outbreak of war, using 245,000 soldiers and its million veterans.<sup>138</sup> After the initial rhetoric, however, the House turned to mundane political matters as the Senate had done; debate ensued over the competence of the Ordnance Department and the location of the gun foundry.<sup>139</sup>

In spite of all obstacles, however, the bill passed both houses. It was far reduced from Senator Dolph's hopes, however, providing only \$3.47 million for construction of forts, guns, and an arsenal, and for purchase of forgings. In addition, the advocates of private gun manufacture prevailed, and the bill provided \$6.5 million for contracting for finished guns from private firms. Additionally, the bill created a Board of Ordnance and Fortifications to coordinate planning and building the defenses.<sup>140</sup>

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<sup>136</sup>U.S., Congress, House, 50th Cong., 1st Sess., CR, Vol. 19, pp. 7505 ff and 7541-7547.

<sup>137</sup>Ibid., p. 7581.

<sup>138</sup>Ibid.

<sup>139</sup>Ibid., pp. 7584, 7593.

<sup>140</sup>SAL, 25: 489-491: 1028. In this and succeeding appropriations bills, amounts are rounded to the nearest \$0.01 Million (\$10,000).

In addition to a start on the long-delayed work of coast defense, another matter was settled in 1888; that was the question of the most cost-effective material for manufacture of cannon in the United States. Although all government boards had recommended against its use, steel manufacturers in the United States had hoped that Bessemer process steel would prove suitable for ordnance, as it was a much cheaper process than the laborious process involved in constructing a built-up gun. Additionally, the Bessemer process was used widely in the United States. In January 1888, a six-inch Bessemer gun was cast, the biggest ever, at a cost of about \$3,300 compared with costs of \$22,000 for a built-up steel gun.<sup>141</sup> When tested by the Ordnance Department, the gun exploded on the second round fired.<sup>142</sup> Although the manufacturer, the Pittsburgh Steel Casting Company, alleged that government tampering had caused the failure, it resolved to cast no more. It appeared that the built-up gun was the only solution to the problem of elasticity.<sup>143</sup>

Manufacture of steel cannon in the United States was not a simple matter of contracting for weapons and having them delivered to the Army and Navy after fabrication. It had taken almost a year and a half of work around the clock for Krupp to produce the first fourteen-inch rifle, even after more than twenty years experience at making smaller steel guns.<sup>144</sup> There was no reason to believe that firms in the United States could progress more rapidly, given the prevailing lack of experience and Krupp's

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<sup>141</sup>NYT, 12 January 1888, p. 1.

<sup>142</sup>Ibid., 6 December 1888, p. 1.

<sup>143</sup>Ibid., 7 December 1888, p. 1, and C. F. Goodrich, "Our New Naval Guns," p. 669.

<sup>144</sup>"The Defense of Our Sea-Ports," p. 61.

reluctance to share the secrets of his company. There had been no foundry in the United States which could produce steel of sufficient quality for artillery when the first development contract was let in 1883.<sup>145</sup> Only one firm, the Midvale Steel Company, was able to produce eight inch forgings by 1886, while two other foundries were able to produce smaller castings.<sup>146</sup> All steel contracts of the time were marked by a large number of unsatisfactory castings owing to the inexperience of the manufacturer in producing steel of the required quality. As a result, contractors completed the contracts at a loss and long delays ensued in providing the forgings to the Army.<sup>147</sup> Because of the problems of domestic steel manufacturers, the first steel breech-loading rifle built in the United States was made entirely of foreign steel.<sup>148</sup> Nonetheless, a start toward funding for coast defense had been made, and the cause would continue to receive grudging support through the remaining years of the century.

The second session of the Fiftieth Congress spent little time on appropriations for fortifications, appropriating \$1.62 million.<sup>149</sup> The Congress apparently felt that since the guns would require several years to build, there was no reason to make large appropriations until the manufacture of guns had begun to show results.<sup>150</sup> Perhaps the best assessment of the

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<sup>145</sup>Greene, "Our Defenceless Coasts," p. 61.

<sup>146</sup>Chief of Ordnance Report of 1886, pp. 16-17.

<sup>147</sup>*Ibid.*, pp. 16, 326, 356.

<sup>148</sup>*Ibid.*, pp. 13 ff.

<sup>149</sup>SAL, 25: 886-888: 404; 2 March 1889.

<sup>150</sup>Alleging that the plans for fortifications had been stopped before they had really gotten started, a New York Times editorial lamented that the House was waiting for the guns to be ready before voting more funds in the hope that "something novel in fortifications may be discovered" in the interim, calling this the same policy that kept the ports undefended earlier in the decade. NYT, 7 January 1889, p. 4.



accomplishments of the Fiftieth Congress concerning coast defenses was expressed by Representative Richard W. Townshend, an Illinois Democrat. On the House floor on 28 February 1889, he said that the naval policy of the Cleveland administration had been good, but that the administration had not done its duty regarding coastal fortifications. He predicted that the incoming administration would be praised if it could quickly provide for the nation's needs on the coasts, but he regretted that his party, in power for four years under a Democratic president had neglected the defense of the country. "Congress," he said, "in which each party controlled a branch, is responsible . . . unless we are prepared for offensive as well as defensive war on shore and on the sea, the first great power that may attempt it may annihilate the Monroe Doctrine."<sup>151</sup> His statement was a harbinger of an increasingly growing awareness in Americans of their country as a world power.

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<sup>151</sup>U.S., Congress, House, 50th Cong., 2d Sess., CR, vol. 20, pp. 2492-2493.

## THE POLITICS OF COAST DEFENSE, 1890-1898

The incipient involvement of the United States in world affairs had begun to increase in the mid-1880's, with several diplomatic incidents which are today little more than footnotes to the history of American foreign relations; at the time, however, the President, Congress, and the citizenry perceived them in varying degrees as potential armed conflicts. Several deserve some examination, more for the public perceptions of their potential for precipitating wars at the time than for a retrospective analysis of the actual likelihood of conflict.

During the decade of the 1880's, the question of where a canal across the isthmus should be dug and who would construct and control it held a substantial potential for causing conflict or confrontation. The United States held the position that a canal dug there and controlled by a power outside the western hemisphere was a violation of the Monroe Doctrine. Nonetheless, France had been digging a canal from 1881 to 1890. Additionally, the Clayton-Bulwer Treaty prevented the United States from building a canal which she alone could control. The danger of war from canal incidents was a favorite topic which proponents of increased coast

defense cited in Congress and the press.<sup>1</sup>

American interests in the Pacific were growing at the same time as the question of a isthmian canal; Hawaii and Samoa stand as representative examples. In approving ratification of a renewal of the reciprocity treaty with Hawaii, the Senate in 1887 added provisions for the U.S. naval base at Pearl Harbor. This made Hawaii a site of possible future incidents, as both Britain and Japan were interested in the islands. A confrontation with ominous overtones developed in Samoa the same year when the United States, although without a significant financial or trade interests in the area, refused to compromise with Germany over the question of sovereignty in the islands. By 1889, the navies of Britain, Germany, and the United States were in Samoa in a virtual standoff; neither the Americans nor the Germans were ready to back off from their position. A typhoon destroyed both the American and German fleets in Apia harbor in March 1889, preventing any possible showdown between the two powers. Although any incident in Samoa would have been unlikely to lead to war, the fact that such a volatile confrontation could occur so far from American shores indicated the growing involvement of the United States in World affairs.<sup>2</sup>

Although some observers could see a growing involvement of the United States in world affairs in such incidents and developments, much of the citizenry and many Congressmen apparently did not. To much of the country, these were merely aberrations in the more normal foreign policy the United

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<sup>1</sup>Among others, see U.S., Congress, House, 49th Cong., 1st Sess., CR (17: 6765) and NYT, 1 July 1885, p. 1. For an outline of the canal question in perspective, see Julius W. Pratt, A History of United States Foreign Policy (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1955), pp. 329-30, and also see W. T. Sampson, "Outline of a Scheme for Naval Defense of the Coast," USNIP, vol. 15, p. 180.

<sup>2</sup>Pratt, United States Foreign Policy, pp. 320-334.

States had followed to that time: one of isolation and non-involvement in world affairs. Certainly there was no reason to believe that such occurrences presaged international crises or wars which could require stronger military policies than those which had sufficed for the United States during the past century.

After Congress approved the first appropriation for a new system of coast defense in 1888, each succeeding Congress approved some funds for improved coastal defenses. None were as large as recommended by the Endicott Board. Moreover, moneys voted declined steadily from 1890 to 1895. They were adequate only to build the steel industry and to give the Ordnance Department experience in constructing heavy cannon. Often they barely exceeded the "fixed costs" of salaries and factory upkeep. They did little to begin constructing new forts. Had the sums voted continued at the pace of the period from 1888 to 1895, they would have been inadequate to complete rebuilding the fortifications before the mid-twentieth century. Appropriations averaged less than three million dollars annually, if the amounts for contracting guns (which never became a very successful program) are disregarded; with these funds included, the total still averaged less than five million dollars annually (see Figure 5).

Debate over the appropriations bills for fortifications followed the same pattern year after year, with passionate advocacy by coastal Congressmen and perfunctory opposition by opponents. Opposition was usually against any money for defense rather than specifically against fortifications. In many Congresses, both parties accused one another of playing politics with coastal fortifications. It seems apparent that the large bloc of non-coastal representation caused large appropriations to fail even without organized opposition; certainly support from coastal

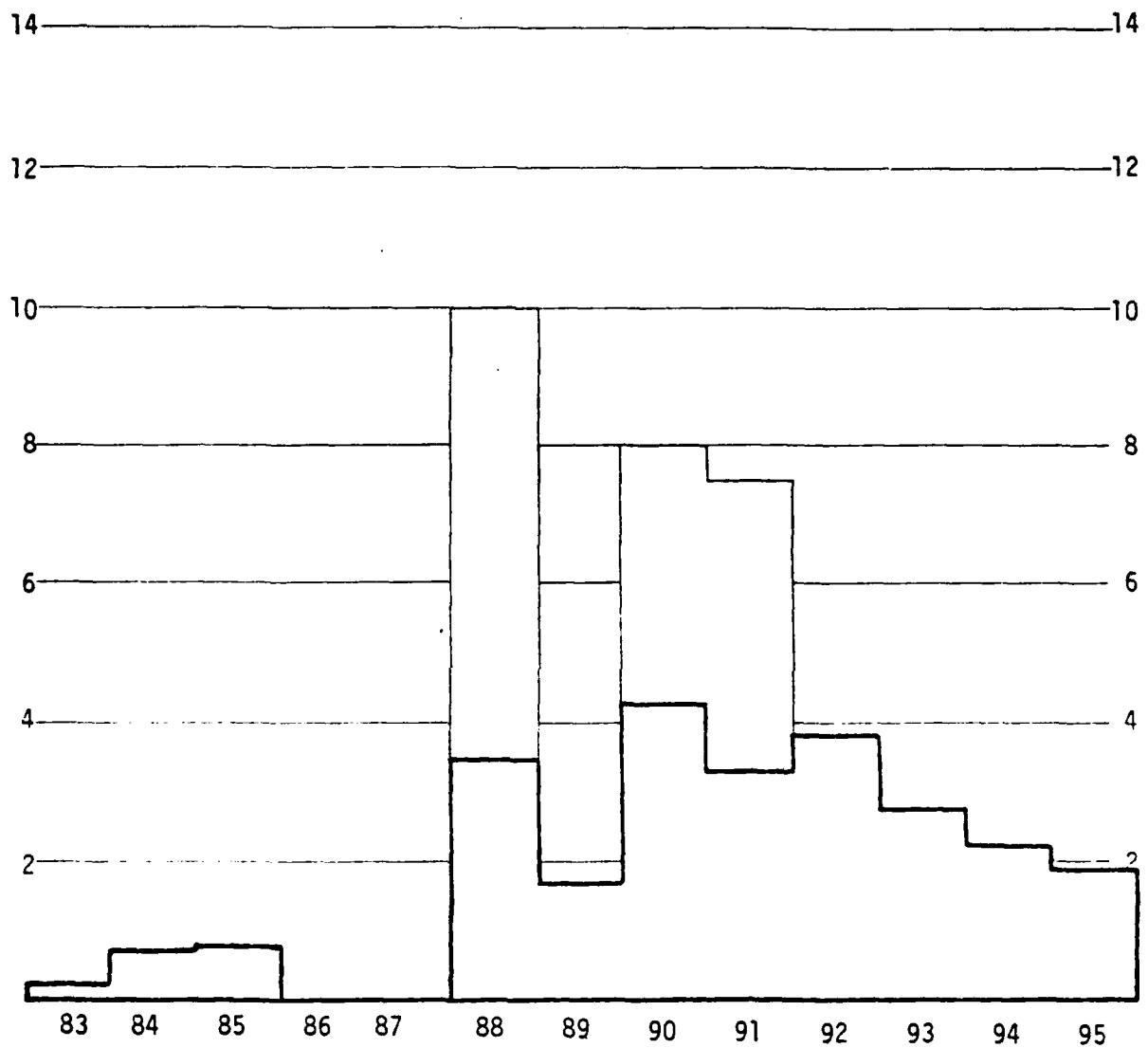


FIGURE 5

Appropriations for Coastal Defense, 1883-1895, in Millions of Dollars  
 (N. B. Lightly outlined blocks above appropriations for 1888, 1890, and  
 1891 are funds available for finished ordnance from private firms.)  
 Source: SAL, Fortifications Appropriations bills for years indicated.

congressmen was usually bipartisan.<sup>3</sup>

Other than the argument that sectional disparity between coastal and interior legislators caused failure of the bills, there is no single irrefutable answer to explain congressional reluctance to appropriate funds for coastal defense. There was a surplus in the Treasury during part of the period, coastal public opinion favored defenses, and the need was clearly articulated; yet only appropriations which were inadequate for timely defenses were made.<sup>4</sup> Although politicians often tried to pass legislation which would be profitable to their constituencies, allegations of individual interests as the primary cause for failure of the appropriations are probably too strong. More likely the lack of larger appropriations reflected simply the lassitude often seen in legislative bodies when faced with an abstruse, yet nebulous problem for which there is no clear and verifiable solution: it apparently seemed easier to accept blame for doing little than to risk censure for making the wrong decision.

The campaign of 1882 was fought primarily on tariff and tax reduction, with questions of military policy being peripheral. The Democratic platform was moderately supportive of the Navy, but did not mention any other military questions. The Republican Party, however, was strongly pro-Navy, and advocated new coastal fortifications and ordnance; it also moved into the

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<sup>3</sup>U.S., Congress, 50th Cong., 2nd Sess. through 52nd Cong., 2nd Sess., CR, and SAL: 25: 886-888: 404, 26: 315-320: 797; 26: 767-770: 283, 27: 257-260: 233; 27: 458-461: 136, 28: 212-215: 178; 28: 704-707: 162.

<sup>4</sup>U.S., Congress, Senate, Report of the Committee on Coast Defense, "Report to Accompany Bill S. 62," 50th Cong., 1st Sess., 19 March 1886, vol. 4, no. 603, p. 19, and F. V. Greene, "Our Defenceless Coasts," Scribner's Magazine 1 (January 1887): 65-66, and "The Defense of Our Sea-Ports," Harper's New Monthly Magazine 71 (November 1885): 937.

area of foreign expansion by advocating construction of an isthmian canal in Nicaragua.<sup>5</sup> The Republicans were successful in the elections, putting Benjamin Harrison in office as President and giving the party small majorities in both houses of Congress.<sup>6</sup>

President Harrison, in his first annual message in 1889, recommended strong coast defenses as his predecessors in office had:

Judged by modern standards, we are practically without coast defenses. Many of the structures we have would enhance rather than diminish the perils of their garrisons if subjected to the fire of improved guns, and very few are so located as to give full effect to the greater range of such guns as we are now making for coast-defense uses. This general subject has had consideration in Congress for some years, and the appropriation for the construction of large rifled guns made one year ago was, I am sure, the expression of a purpose to provide suitable works in which these guns might be mounted. An appropriation now made for that purpose would not advance the completion of the works beyond our ability to supply them with fairly effective guns.

The security of our coast cities against foreign attacks should not rest altogether in the friendly disposition of other nations. There should be a second line wholly in our own keeping. I very urgently recommend an appropriation at this session for the construction of such works in our most exposed harbors.<sup>7</sup>

Congress opened debate on the appropriations bill for fortifications

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<sup>5</sup>Kirk H. Porter, ed., National Party Platforms (New York: Macmillan Co., 1924), pp. 141, 150, 151.

<sup>6</sup>51st Congress (1889-1891): House: R166, D159; Senate: R39, D37. Webster's Guide to American History (Springfield, Mass.: G. & C. Merriam Co., [1971]), p. 776.

<sup>7</sup>Messages and Papers, vol. 12, p. 5476, (3 December 1889). President Harrison would continue to be a strong advocate of improved coastal defenses in his annual messages. On 1 December 1890, he recommended "that adequate and regular appropriations be continued for coast defense works and ordnance[;] . . . there can be no good reason for delaying the execution of them, while the defenseless state of our great seaports furnishes an urgent reason for wise expedition. Ibid., p. 5550. In 1891, he said that any delay in improving coast defenses should not be for lack of funds, for their importance lay in allowing the 'proper distribution and use' of naval vessels. Ibid., p. 5631. The following year he observed that work on the defenses had begun and urged its continuance without delay. Ibid., p. 5755.

in April 1890, with the prevailing mood among the Democrats being one of chauvinistic isolationism. After a speech in the House strongly advocating improved coast defenses, Representative William S. Holman, a Democrat from the interior state of Indiana, spoke against the bill. "The real fortifications . . . of value," he said, "were those which were improvised and thrown up on the spur of the hour."<sup>8</sup> He continued that the United States could quickly put seven and a half million men in the field in the event of war; surely there was no justification for taxing the people to pay for an Army, a Navy, and permanent fortifications.<sup>9</sup> Since Holman was called "the watchdog of the treasury," "the great objector," and "the hayseed statesman" by his contemporaries,<sup>10</sup> one may infer that his objection may have been based more on fiscal or party grounds than on a careful analysis of the coastal defense needs of the country.

In the upper house, Senator Frances M. Cockrell, a Democrat from Missouri, spoke against the bill with sentiments similar to those of Representative Holman. In the event of an attack, he said, the "people of this great country . . . would rise en masse, men, women, and children to defer the honor . . . of this great country, and all the nations of the earth know it."<sup>11</sup> He did not find it necessary to elaborate on what tactics the men, women, and children would use in fighting against modern warships without heavy weapons, for he felt that arbitration would solve any international

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<sup>8</sup>U.S., Congress, House, 51st Cong., 1st Sess., CR (21: 2883 ff and 2887, 1 April 1890).

<sup>9</sup>Ibid.

<sup>10</sup>Dan and Inez Morris, Who Was Who in American Politics (New York: Hawthorn Books, Inc. [1974]), p. 316.

<sup>11</sup>U.S., Congress, Senate, 51st Cong., 1st Sess., CR (21: 5536, 3 June 1890).



problem.<sup>12</sup>

In spite of the detractors, the relatively meager bill passed Congress and became law on 18 August 1890. It provided \$4.23 million for both the fortifications and government ordnance, but it encouraged private manufacture by authorizing an additional \$3.78 million for contracts with civilian industry to build weapons. The bill also required the President to appoint a board to investigate the feasibility of manufacturing guns in government arsenals on the Pacific or Gulf coasts. The primary loser in the bill was Watervliet Arsenal, the Army's only heavy gun factory, whose funds were cut to just over half a million dollars,<sup>13</sup> just enough to maintain the facility at a minimum operational level.

An editorial in the New York Times saw the cut in funds for Watervliet Arsenal as *unwise and a move backwards* in coast defense. The cut in funding for the Army Gun Factory were contrasted to that of the Naval Ordnance Factory (previously called the Washington Navy Yard), whose appropriations had been regular and adequate.<sup>14</sup> Earlier, the newspaper had characterized the defenselessness of the United States as the height of fatuity. The editorial continued that although the nation needed coast defenses desperately, it was difficult to convince legislators to take action because there was no political advantage to be had in voting for the measure.<sup>15</sup>

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<sup>12</sup>Ibid.

<sup>13</sup>SAL, 26: 315-320: 797.

<sup>14</sup>NYT, 8 August 1890, p. 4.

<sup>15</sup>Ibid., 23 July 1890, p. 4.

In the 1891 Second Session of the Fifty-first Congress, legislators conducted debate on the appropriations bill for fortifications along lines which were by now familiar to all participants. Advocates strongly supported the measure, while opponents limited their arguments to charges that fortifications were unneeded or amounted to warmongering. Citing the relative unimportance of coastal cities compared with the rest of the nation was a favorite theme of Congressmen without coastal cities, and their regional chauvinism apparently pleased their interior constituents. A senator from New Hampshire, in opposing the bill said that in the event of attack, damage to coastal cities would little harm the country as a whole, for "suppose the city of New York was bombarded [and] . . . substantially destroyed . . .; what effect would that have upon the people of the United States comparatively? It would not be a flea bite on the resources of this country."<sup>16</sup> Nonetheless, the opposition was comparatively mild when measured against the passion of the proponents of fortifications; once again the opponents were marked more often by their apathy than their argument.

Senator Joseph R. Hawley, a Republican from Connecticut, objected to the large funds which had been authorized for private gun contracts in the 1888 and 1890 bills and which were proposed in the current bill. He said that such expenditures were worthless, since there was not enough certainty of continued appropriations to convince the civilian industrialists to make the huge investments required for production of heavy ordnance.<sup>17</sup> His appraisal would later prove correct, for the private manufacturers

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<sup>16</sup>U.S., Congress, Senate, Senator Blair (R/NH) speaking against the Appropriations Bill for Fortifications and Other Defense, 3 February 1891, 51st Cong., 2nd Sess., CR (22: 2083). For other debate, see 2053-2058.

<sup>17</sup>*Ibid.*, pp. 2053-2055 (2 February 1891).

quite practicable. The editorial observed that the political question was largely regional; interior statesmen "chuckled" because war could only come to New York.<sup>21</sup> Later, the paper reported on an address by Senator Joseph Hawley (R/CT) before the Hartford Board of Trade. Senator Hawley had observed that British vessels could steam to attack United States harbors in sixty hours, Spanish vessels in one hundred hours; the harbors were defenseless in the event of such attack. Although he cited no immediate threat to the peace, he observed that people who had gone to sleep in peace could awake at war.<sup>22</sup> In an editorial commenting on Hawley's address, the writer opined that the "billion dollar [Fifty-first] Congress" would have done better to appropriate adequate funds for defense than for pork barrel projects.<sup>23</sup>

Early in 1891, a civil war had broken out in Chile which threatened to involve the United States in a more serious international confrontation than the preceding ones. During the war, the United States sympathized with the government in power under President Jose M. Balmaceda and seized arms from a rebel ship in the Chilean harbor of Iquique after attempting to impound the ship on a stop in San Diego. American support of the Balmaceda regime inspired intense anti-American feelings in Chile, after the rebels had been successful in September. In October, sailors of the U.S.S. Baltimore were allowed shore leave in Valparaiso; a riot ensued in which two sailors were killed and seventeen wounded. Although the situation simmered through the fall, by January 1892, other inflammatory developments caused

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<sup>21</sup>NYT, 3 April 1891, p. 4.

<sup>22</sup>Ibid., 13 April 1891, p. 8.

<sup>23</sup>Ibid., 15 April 1891, p. 4.

President Harrison to demand a Chilean apology and reparations for the incident. For a time the President, British observers, and at least some of the American public felt that war was imminent.<sup>24</sup>

During the crisis with Chile, the Departments of War and the Navy made a number of preparations for war. The Navy's ordnance factory began working twelve to fourteen hours per day, and prepared to go to an around-the-clock schedule if war were declared.<sup>25</sup> There was a general stir of activity throughout all the defense agencies.<sup>26</sup> The Army prepared to mobilize several regiments of infantry and artillery, particularly on the Pacific coast.<sup>27</sup> The Navy expedited work on torpedoes and shipments of armor, and prepared to mount new guns on obsolete mounts as modern mounts were not yet finished.<sup>28</sup> Because of the perennial dispute in Congress over whether the Army should build guns or buy them from private manufacturers, the Army was at a disadvantage with respect to the Navy in terms of modern ordnance on hand; the Navy's gun factory had been in full production for some years, while the Army's Watervliet arsenal had just turned out its first twelve-inch gun the preceding summer. Meager appropriations and slow deliveries of steel from manufacturers had been factors in the delay; the

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<sup>24</sup>For a fuller account of the Chilean incident, see Campbell, The Transformation of American Foreign Relations, pp. 168-176. For U.S. sentiment, see NYT, 21 December 1891, p. 5; 23 December 1891, p. 1; 24 December 1891, p. 3; 25 December 1891, p. 1; for an account of the Valparaiso riot, see U.S., Congress, House, 52nd Cong., 1st Sess., House Executive Documents, No. 91, pp. 105 ff.

<sup>25</sup>NYT, 26 December 1891, p. 1.

<sup>26</sup>For examples, see *Ibid.*, 21 December 1891, p. 9; 27 December 1891, p. 1; 29 December 1891, p. 2; 2 January 1892, p. 1.

<sup>27</sup>*Ibid.*, 28 December 1891, p. 4; 15 January 1892.

<sup>28</sup>*Ibid.*, 14 January 1892, p. 4; 15 January 1892, p. 1.

first gun was built of forgings purchased from France. Because of the lack of guns for coast defense, it was proposed that the Army use completed guns of the Navy for that purpose.<sup>29</sup> A summer editorial in the New York Times saw this as a "welcome sign that such a piece of ordnance at last actually exists here, ready for use," and alluded to the "great need to carry forward more rapidly the manufacture of [such] guns."<sup>30</sup> By the end of the year, in light of the Chilean crisis, the paper commented sourly that "if the United States had been in the habit of preparing in all times of peace for possible hostilities that were not foreseen, there would be less interest aroused now by unmistakably unusual energy and push" of the hasty preparations for war.<sup>31</sup>

When the Chilean crisis had cooled, the New York Times saw a silver lining in its demonstration of the need for improved defenses. In the event of conflict with a stronger foe than Chile, American defenses would have been seriously inadequate; the United States needed both a strong navy and strong coastal fortifications. In particular, the Army's Watervliet arsenal needed expansion.<sup>32</sup>

Even with the impetus of the Chilean crisis, the political changes of the Fifty-second Congress kept any increase in spending for coastal defenses from occurring. The Democrats had gained an overwhelming majority in the House, 235 Democrats to 88 Republicans, while the Republican had only slightly increased their majority in the Senate, 47 to 39.<sup>33</sup> The more

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<sup>29</sup>Ibid., 5 June 1891, p. 1; 6 December 1891, p. 4.

<sup>30</sup>Ibid., 15 June 1891, p. 4.

<sup>31</sup>Ibid., 30 December 1891, p. 1.

<sup>32</sup>Ibid., 28 January 1892, p. 4.

<sup>33</sup>Webster's Guide, p. 776.

isolationist sentiments of the Democratic party would prevail. In 1892, the War Department asked for \$9.4 million for coast defense; in committee, representatives cut the request to \$2.4 million.<sup>34</sup> When the bill appeared on the floor of the House for debate, an inland representative observed that he favored appropriating only enough funds to continue operations, for since completion date of the coast defenses was not projected to be until 1920, "the addition of a year or two . . . was not a matter of very extraordinary importance."<sup>35</sup> Although opponents protested that the measure was not enough, their sentiment did not prevail; economy was the order of the day.<sup>36</sup> In the Senate, spokesmen from the Pacific Coast protested that in the Chilean crisis, there were only three guns and four mortars available for the entire coastline north of California; they strongly advocated a west coast gun factory.<sup>37</sup> In the end, the bill approved appointment of yet another board, this one to select the best sites for a Pacific gun factory and appropriated \$3.78 million for fortifications and ordnance.<sup>38</sup> Obviously the Chilean crisis had not convinced many legislators of the need for improved coast defenses.

The Second Session of the Fifty-second Congress appropriated only \$2.73 million for coast defenses.<sup>39</sup> After the measure passed the House, the New York Times acidly observed that it was a "familiar experience that

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<sup>34</sup>NYT, 28 April 1892, p. 10.

<sup>35</sup>U.S., Congress, House, 52nd Cong., 1st Sess., CR 23: 5294. (Representative Breckenridge, D/KY, 15 June 1892.)

<sup>36</sup>Ibid., 23: 5294 ff.

<sup>37</sup>Ibid., Senate, 23: 6200-6214.

<sup>38</sup>SAL, 27: 257-260: 233 (23 July 1892).

<sup>39</sup>SAL, 27: 458-461: 36 (18 February 1893).

when the spirit of economy seizes Congress--and more especially when Congress desires to appear possessed by that spirit--its brunt falls on the provisions for coast defense" rather than on measures for rivers and harbors, public buildings, or pensions.<sup>40</sup> As so often before, the debates were marked by passionate advocacy and lukewarm opposition. Senator Dolph of Oregon, speaking for increased appropriations for coast defense, said that the United States was "engaged in an unequal contest for the trade in the Pacific with Great Britain."<sup>41</sup> In his view, the United States had made mistakes in the past by not annexing or establishing protectorates over the Dominican Republic, Samoa, and Nicaragua, and by relinquishing claims to the northern boundary at 54°40'. Annexation of Hawaii and quick construction of an Isthmian canal would help avoid further mistakes.<sup>42</sup> He largely left it to his listeners to draw the conclusion that interests outside the continent would bring conflict, which would mean that coast defenses would be required.

The bill did not provide funds adequate to pay government contracts coming due during the fiscal year. Questioned on the deficiency, a committee member said that they thought it prudent to provide less than the amounts contracted since deliveries were often slow. At this, Senator Joseph R. Hawley (R/CT) blasted the committee for its short-sightedness. The bill, was not half what it should be, he said, and by their inadequate appropriations for contracts, Congress was telling manufacturers to slow down in deliveries; why shouldn't the entire amount be appropriated and thus tell

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<sup>40</sup>NYT, 12 January 1893, p. 4.

<sup>41</sup>U.S., Congress, Senate, 52nd Congress., 2nd Sess., CR 24: 999.

<sup>42</sup>Ibid., pp. 997-999.

the manufacturers to speed up?<sup>43</sup> As a result of such appropriations, guns that could have been made in four to five years were taking eight to nine instead.<sup>44</sup> Congress was required to create coast defenses ab initio, Hawley continued, "yet we are going on in a happy-go-lucky, optimistic way as if we were assured that there will be no trouble whatsoever." While Congress procrastinated, Hawley said, concerned citizens were discussing what measures the nation could take in the event of an emergency. While Congress economized for the moment, land speculators were buying up areas the government would need for coast defense, knowing they would eventually profit from later appropriations.<sup>45</sup>

Hawley's fellow-senator from Connecticut, Orville H. Platt, seconded Hawley's remarks, regarding the bill as showing that Congress did not plan to do anything for coast defense. In a letter which Platt entered in the Congressional Record, the chief of ordnance said that reductions below three million dollars for his department would mean curtailing supplies or idling the gun factory, yet the present bill was providing the department with only half a million dollars. "It seems," Platt continued,

. . . that we forget that we have become a great country; it seems we forget that to carry on the operations of a great country costs some money . . . if we do not need any coast defenses, . . . any fortifications, . . . any guns, do not let us appropriate any money for that purpose. . . . I have not any patience with this kind of economy. It does most expensively what is to be done; it does nothing which is adequate to the condition and needs of our country; and I had much rather see this whole appropriation for guns stricken out, and see our shops closed absolutely, as they will be practically, than to go on with the idea that we have made some appropriation . . . to provide

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<sup>43</sup>Ibid., p. 1039.

<sup>44</sup>Ibid., p. 1042.

<sup>45</sup>Ibid., p. 1039.



for coast defenses and the manufacture of guns.<sup>46</sup>

In spite of the fervent advocacy of the coastal senators for additional funds, the tiny bill passed only slightly amended.<sup>47</sup>

The elections of 1892 were fought over the question of the tariff; military policy went virtually unmentioned in both major party platforms, although both parties by now favored a strong navy, the Democrats specifying that it be for defense. Grover Cleveland was the successful Democratic candidate, and with him, control of the Congress passed firmly to the Democratic party.<sup>48</sup> The Fifty-third Congress (1893-1895) would appropriate declining amounts for coast defense. There was little impassioned debate for or against coast defenses through that congressional term, and appropriations passed routinely: \$2.21 million in 1894<sup>49</sup> and \$1.89 million in 1895.<sup>50</sup> In 1895, the purchase of land for sites for coast defense was halted entirely; as predicted, speculators now owned the sites and were demanding exorbitant prices.<sup>51</sup>

Some senators backed and very nearly passed clever legislation in 1895 which would have given a windfall to the makers of antiquated cast-iron

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<sup>46</sup>*Ibid.*, pp. 1039-1041. Another Republican observed that at the rate of spending of 1892-1893, it would take sixty-three years to protect New York and Baltimore. *Ibid.*, p. 1042.

<sup>47</sup>*SAL*, 27: 458-461: 36.

<sup>48</sup>53rd Congress: House: D218, R127; Senate: D44, R38. *Webster's Guide*, p. 776. Platform information in Porter, *National Party Platforms*, pp. 163, 174.

<sup>49</sup>*SAL*, 28: 212-215; 178 (1 August 1894).

<sup>50</sup>*Ibid.*, 28: 704-707: 162 (2 March 1895).

<sup>51</sup>U.S., Congress, House, 53rd Cong., 3rd Sess., *CR* 27: 300 (13 December 1894). For other aspects of problem of obtaining sites for fortifications, see *ibid.*, 53rd Cong., 2nd Sess., 26: 2534 (2 March 1894), and *NYT*, 20 February 1893, p. 4; 25 October 1893, p. 9.

mortars, while raiding the Army's meager funds for purchasing ordnance. The senators had tried to force the renewal of an 1888 provision which required the Army to test any mortar provided by "any party"; if the mortar matched the performance of the twelve-inch cast-iron steel-hooped mortar of 1833, the Army would have had to purchase not less than fifty nor more than one hundred additional mortars at a cost of \$6,500 each. As the 1888 mortar had long since been surpassed by steel mortars, this provision would have, in effect, required the Army to use its restricted funds to buy antiquated mortars which might or might not have performed to the low standards of antiquated mortars. Even worse, only the mortar provided for testing had to match the performance of the 1888 mortar; should the additional mortars under contract fail to match the original performance, they had to be purchased anyway. The measure was backed by Senator Arthur Gorman, a Democrat from Maryland and a perennial critic of the intransigence of the Army ordnance department for its refusal to accept civilian inventions. William Cramp and Sons, a Philadelphia iron works, may have been the intended recipient of the largesse, at least according to the New York Times. After the Chief of Ordnance notified Congress of the amendment's implications, the amendment was changed so that the tested mortar would have to match the "best breech-loading service mortar in use" and only fifty would have to be purchased.<sup>52</sup>

The hopes of proponents of coast defense soared when elections for the Fifty-fourth Congress (1895-1897) passed control back to the Republican party.<sup>53</sup> In the months before the first session took up the question of

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<sup>52</sup>NYT, 1 March 1895, p. 10, and 11 March 1895, p. 4; wording of both amendments is in SAL, 28: 707: 162.

<sup>53</sup>54th Congress: House: R244, D105; Senate: R43, D39. Webster's Guide, p. 776.

coast defense, War Department officials and editorialists pumped for increased appropriations. In the annual report of the Chief of Engineers, the nation's coast defense was described as backward and barely begun; the same year that Congress had provided only two million dollars for coast defense, it had provided \$15.4 million for river and harbor improvements.<sup>54</sup>

Lieutenant General Nelson A. Miles, the new Commanding General of the Army, devoted his first annual report to the defenselessness of the country, saying there was nothing to prevent an enemy from burning the capitol as the British indeed had in 1812.<sup>55</sup> Earlier, an editorialist had advocated appropriating \$48 million for guns and forts for coast defense, with still more money for buying land for the purpose. The amount would not be excessive, for in the past, Congress had proved willing to appropriate three to four times as much for river and harbor improvements and forty times as much for pensions as it had for coast defense. Additionally, the editorial continued, coast defenses had advantages over other forms of military spending: they could not be used for aggression, only for defense, and they were comparatively inexpensive to maintain.<sup>56</sup> But in spite of all other arguments, Congress would be convinced, not by special pleaders, but by international developments.

Since the 1840's, Britain and Venezuela had differed over the location of the boundary between British Guiana and Venezuela. Although Venezuela had asked the United States to invoke the Monroe Doctrine and assist her in the dispute, the United States took no action until 1888, when Congress passed a resolution requesting information. There the matter

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<sup>54</sup>NYT, 16 November 1895, p. 13.

<sup>55</sup>Ibid., 8 December 1895, p. 4.

<sup>56</sup>Ibid., 21, August 1895, p. 4.

rested, with only minor stirs until 1894, when the ex-minister to Venezuela from the United States began fomenting public opinion within the United States against Britain. In July 1895, Cleveland's new Secretary of State, Richard Olney, sent a tersely worded message to the British government asking that they submit the dispute over the Venezuela boundary to arbitration.<sup>57</sup> Cleveland himself called the message a "twenty-inch gun,"<sup>58</sup> and it was certainly as noisy and potentially as diplomatically powerful as a cannon. Many members of Congress and much of the American public quickly became inflamed to one degree or another with the righteousness of the American position as protector of the weaker nations of the hemisphere. By 8 December, the New York Times was again trying to find a silver lining in the clouds of war. "The wrath and folly of the jingo may serve a good purpose," it editorialized, "if it really calls attention to the unprotected condition of our coasts;" allowing their defenseless state to persist was "improvidence . . . [and] reckless to the point of madness." The "inland jingoes" were not protected and would suffer with the coastal inhabitants.<sup>59</sup>

Britain's answer to the Olney message on Venezuela did not arrive in Washington until the First Session of the Fifty-fourth Congress had opened. The British response was not particularly conciliatory and refused arbitration, but it was nothing beside Cleveland's reaction to the British

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<sup>57</sup>For details of the Venezuela boundary dispute, see Dexter Perkins, A History of the Monroe Doctrine (Boston: Little, Brown, & Co., [1963]), pp. 172-191, and Campbell, The Transformation of American Foreign Relations, pp. 194-221, and Robert H. Ferrell, American Diplomacy: A History (New York: W. W. Norton & Co., [1975]), pp. 335-342.

<sup>58</sup>Campbell, The Transformation of American Foreign Relations, p. 198.

<sup>59</sup>NYT, 8 December 1895, p. 4.

message. On 17 December 1895, Cleveland sent a letter to Congress saying that Britain's refusal to arbitrate meant that the United States would determine the boundary. In its virtual ultimatum to Britain, it was essentially a war message. Congress responded with a rousing backing of Cleveland's position.<sup>60</sup> To many Americans, war seemed inevitable.<sup>61</sup> The effect of the Venezuela message, when the vulnerability of the United States began to be understood, was electric. By March, an analyst would write:

The document which President Cleveland sent to Congress, on the afternoon of December 17, 1885, changed the entire aspect of affairs and brought about a new order of public sentiment on the question of national defence. . . . The President's declaration was one of defiance--possibly of war--against the most powerful and resourceful nation of Europe. It startled, especially because the practical judgment of Americans told them that they were totally, negligently, and almost criminally, unprepared even for defence on land, much less aggression on the ocean.

Britannia ruled the waves as in the days of Drake and Nelson, while her military outposts extended along our northern border; and hostilities meant the immediate advent of flying squadrons off the harbors . . .

The situation was humiliating, as well as startling. . . . what a commentary it was on the prudence and foresight of the wealthiest people on the globe that we were compelled to rely for protection on the justice of the President's proposition for international arbitration, and the known conservatism of Great Britain. . . .

Throughout . . . the grand harbor and along the magnificent approach from the ocean . . . [New York] enjoyed the protection of only two great guns of modern make, . . . antiquated smooth-bores alone frowned through the portholes . . . of Forts Wadsworth and Hamilton. Fort Lafayette was a picturesque ruin . . .

Boston and San Francisco each have sixteen twelve-inch mortars in position, while a fifteen-inch dynamite gun battery for San Francisco has recently been completed.

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<sup>60</sup>Perkins, The Monroe Doctrine, pp. 177-180, and Campbell, The Transformation of American Foreign Relations, pp. 207-209.

<sup>61</sup>Henry Steel Commager, ed., Documents of American History, 7th ed. (New York: Appleton-Century-Crofts, 1963), 1: 620. (The entire text of the message is also found here.)

All other harbors are absolutely defenceless.<sup>62</sup>

Many communities sent petitions to Congress to request or demand expenditure for defense of their cities.<sup>63</sup> Had war occurred, the Navy could not have defended the United States coasts, for it only possessed one modern battleship at the time.<sup>64</sup> Adding to the problems of United States defense was the fact that Britain had prepared prudently for war on North American shores. The most modern fortifications and ordnance on the continent were in British North America; moreover, she then had over seventy armor-clad warships.<sup>65</sup> Victoria, commanding the Straits of Juan de Fuca and the United States entry to Puget Sound, had mounted modern eighty-ton guns almost a decade earlier.<sup>66</sup> Britain had deepened the Welland Canal enough to allow passage of warships which could reinforce the Great Lakes on short notice.<sup>67</sup>

The time had come to test the theories of previous Congressmen that required defenses could be improvised when a crisis occurred, for the bulk of the defenses of the United States in the event of war in 1896 would have to be improvised ones. The lack of coastal ordnance required the Army to prepare to use field artillery (light, mobile cannon) for coast defense. Representative William Grout of Vermont proposed \$100 million for fortifications and ordnance;<sup>68</sup> three other Congressmen introduced bills in the

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<sup>62</sup>G. N. Southwick, "Our Defenceless Coasts," North American Review 162 (March 1896): 318-319.

<sup>63</sup>Ibid., p. 326.

<sup>64</sup>Perkins, The Monroe Doctrine, p. 185.

<sup>65</sup>U.S., Congress, House, 49th Cong., 1st Sess., CR 17: 7100, and NYT, 26 April 1891, p. 17.

<sup>66</sup>NYT, 30 December 1886, p. 4, and U.S., Congress, House, 50th Cong., 1st Sess., CR 19: 7581.

<sup>67</sup>U.S., Congress, House, 50th Cong., 1st Sess., CR 19: 7581.

<sup>68</sup>NYT, 19 December 1895, p. 1.

same amount.<sup>69</sup> Senator Watson Squire of Washington asked for appropriation of \$87 million to be expended over eleven years; others pushed for pressure on Congress to act while the crisis endured to get funds for matters that were neglected in peace.<sup>70</sup> The naval gun factory was the only one with funds available to go to a twenty-four hour schedule;<sup>71</sup> in fact, at the height of the crisis, the Army's Watervliet Arsenal where all heavy coast defense guns were made, almost had to start laying off workers for lack of funds.<sup>72</sup> In retrospect, it is clear that Britain was not willing to go to war over the Venezuela boundary dispute, but her reluctance was by no means clear to American citizens at the time. The threat which coastal cities perceived then was one of imminent war with a naval power second to none. But a real coastal "panic" was still two years away.

The crisis concerning Venezuela was over for most purposes by mid-January 1896, but the Congressional bustling on coast defenses continued through February. The Commanding General of the Army and the chiefs of ordnance and engineers all testified before congressional committees in January. They affirmed the need for \$87 million in appropriations over several years.<sup>73</sup> For one of the first times, Congress and the American people were given an appreciation of the complementary nature of fortifications and the Navy for coast defense. An article in the New York Times

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<sup>69</sup>Ibid., 27 January 1896, p. 4.

<sup>70</sup>Ibid., also 23 December 1895, p. 4.

<sup>71</sup>Ibid.

<sup>72</sup>Ibid., 10 January 1896, p. 16.

<sup>73</sup>NYT, 3 January 1896, p. 16; 9 January 1896, p. 16; 15 January 1896, p. 15; 29 January 1896, p. 6.

described a purely naval coast defense as impossible, as shown by recent European maneuvers. Unless an entire fleet were provided for each harbor, some areas would be left unprotected.<sup>74</sup> On the Senate floor, Senator Redfield Proctor, Harrison's Secretary of War, argued for the "cost-effectiveness" of fortifications by saying that coastal fortifications were far less expensive than naval vessels and could be cheaply maintained in times of peace, while the naval vessels had the same maintenance requirements in peace or war. Thus, in a tight defense budget, Proctor continued, strong coastal fortifications should precede a strong navy.<sup>75</sup>

In April 1896, a bill providing \$11.38 million (\$5.84 million for fiscal year 1897, the rest in approved contracts) easily passed the House. The speaker introducing the bill began as so many others had, with a history of coast defense in the United States. Starting with estimates of the Endicott Board, he showed that it had projected total expenditures of \$29 million for floating coast defense and \$97 million for shore-based defenses. Yet since the time of the Report, \$136 million had been spent for floating defenses (the figure was apparently arrived at by lumping all spending for naval vessels together as "floating coast defense"), while only \$11 million had been spent on shore-based defenses. He went on to state that the Navy needed coastal defenses to protect their shore installations and ended with the theme of comparative economy. One dollar spent on land defenses, he said, was from nine to twenty-five times as efficient as a dollar spent on naval defenses, both because of initial cost and required maintenance.<sup>76</sup>

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<sup>74</sup>Ibid., 23 February 1896, p. 29.

<sup>75</sup>Ibid., 28 February 1896, p. 2.

<sup>76</sup>U.S., Congress, House, 54th Cong., 1st Sess., CR 28: 3963-3964.



The bill would also succeed, but without enthusiasm, in the Senate.

The Senators received the speech introducing the appropriations bill for fortifications with apathy. The New York Times attributed the apathy to the fact that it was a presidential election year, with a Democratic President and a Republican Senate; had there been a Republican President and Secretary of War, "the marked indifference of Senators in respect of the Squire bill [for fortifications] would give way to eager interest."<sup>77</sup> In spite of the apathy, the bill passed providing \$4.29 million for the year's work.<sup>78</sup>

In the Second Session of the Fifty-fourth Congress, Congressmen began to look at problems of coast defense beyond merely funding for guns. For the first time, the question of artillerymen to man the guns was raised. So long as the Army was limited to four regiments of artillery, they would be spread increasingly thin, having to man both the field artillery units and the coast artillery fortifications. "We are talking a great deal about war nowadays," Senator Hawley said, and the technical training required for artillerymen would be better conducted in peacetime.<sup>79</sup> Later the same year, the New York Chamber of Commerce seconded Senator Hawley's request for artillerymen. In a resolution to the President, the body asked for more harbor defenses and for approval of twice the number of artillerymen;<sup>80</sup> the

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<sup>77</sup>NYT, 11 April 1896, p. 4. The Times did not explain why the same anti-administration sentiment did not prevail in the House, which was even more heavily Republican.

<sup>78</sup>SAL 29: 256-261: 338.

<sup>79</sup>U.S., Congress, Senate, 54th Cong., 2nd Sess., CR 29: 2601-2602 (2 March 1897).

<sup>80</sup>NYT, 5 November 1897, p. 3.

New York Times quickly endorsed the request editorially.<sup>81</sup> The Secretary of War also supported the recommendation.<sup>82</sup> Funds provided for fortifications and ordnance totalled \$9.22 million.<sup>83</sup> In his last annual message, President Cleveland could express a sense of fulfillment in the improvements which had occurred in coast defenses during his administration.

During the past year rapid progress has been made toward the completion of the scheme adopted for the erection and armament of fortifications along our seacoast . . . .

It is peculiarly gratifying at this time to note the great advance that has been made in this important undertaking since the date of my annual message to the Fifty-third Congress, . . . in December, 1893.<sup>84</sup>

In the elections of 1896, the Republicans successfully won the Presidency and both houses of Congress on a platform primarily concerned with monetary policies; for the first time, however, the platform contained strong defense and expansionist planks. The Republicans favored control of the Hawaiian Islands by the United States, purchase of the Danish Islands (the Virgin Islands), intervention in the rebellion in Cuba, construction of the Nicaraguan canal, a strong navy, and "a complete system of harbor and sea-coast defenses."<sup>85</sup>

The Fifty-fifth Congress (1897-1899) did not get around to the question of coast defense in its First Session, but by the Second Session the Cuban revolution was offering journalists, jingoes, and politicians an opportunity for unrestrained rhetoric that would soon lead the United States to

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<sup>81</sup>Ibid., 6 November 1897, p. 6.

<sup>82</sup>Ibid., 23 November 1897, p. 6.

<sup>83</sup>SAL 29: 641-644: 334 (3 March 1897).

<sup>84</sup>Messages and Papers, vol. 13, pp. 6159-6160 (7 December 1896).

<sup>85</sup>55th Congress: House: R204, D113; Senate: R47, D34. Webster's Guide, p. 776. Platform information from Porter, National Party Platforms, pp. 204-205.

war with Spain. Details of the road to the "splendid little war" and its aftermath need not be covered here, but its relation to coast defense questions must be touched on.<sup>86</sup> The appropriations bill for fortifications reached the floor of the House in early February; the Committee on Ordnance and Fortifications recommended only \$4.14 million, instead of the \$13.38 million requested by the War Department.<sup>87</sup> It was clear that Congress, or at least the House, even under Republican control, was not in a mood to follow the lead of the preceding Congress in making appropriations adequate to keep the program for coast defenses moving toward completion. The scare of Venezuela had jolted Congress toward defense, but it proved inadequate to move appropriations out of the ruts of partisan politics.

Debate on the bill for coastal defense was sharply political and sectional. Representative Oscar W. Underwood, a Democrat from Alabama began the criticism of the Republican majority by saying that the United States could not stand up to Spain because the Gulf ports, thought to be the first Spain would attack because of their proximity to Cuba, were not defended.<sup>88</sup> Representative George B. McClellan, a New York Democrat continued by needing the Republicans that their cuts were entirely arbitrary and they had made the question into merely a political one. Representative James A. Hemenway, the Indiana Republican who had sponsored the bill, responded that it was the Democrats who wanted to make appropriations for coast defense

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<sup>86</sup>For background and history of the Spanish-American War, see Walter Millis, The Martial Spirit (Cambridge: The Riverside Press, 1931), and Ferrell, American Diplomacy, ch. 15, or Campbell, The Transformation of American Foreign Relations, chaps. 13, 14.

<sup>87</sup>NYT, 30 January 1898, p. 2.

<sup>88</sup>U.S., Congress, House, 55th Cong., 2nd Sess., CR 31: 1373 (2 February 1898).

into a question of politics, so that they could call the Republican Congress a billion-dollar Congress. Representative Wallace T. Foote, a New York Republican, responded, accusing his fellow Republicans of seeing it merely as a question of politics, as the Democrats charged. Republicans wanted to go to the voters and tell them that they had not been a billion-dollar Congress, so they left the coasts undefended, merely as an accommodation to politics.<sup>89</sup> After the House passed the bill, events outside the Congress moved quickly, precluding further action on the bill for the moment.

In mid-February 1898, the battleship Maine blew up under suspicious circumstances in Havana harbor, shocking the citizenry and moving the Congress to action on defense measures. The New York Times editorialized that the incident made appropriations for forts and ships more necessary but later wondered whether the war scare sweeping the United States might have been concocted merely to pass appropriations bills.<sup>90</sup> By March Congress had quickly and unanimously made an appropriation of \$50,000,000 in March 1898 to try to accomplish in weeks the preparations for defense that it had neglected for years.<sup>91</sup> The New York Times saw the appropriation as a good measure, one that would help the coast defenses and help moves toward peace.<sup>92</sup> Its editorialist observed that it was hard for the citizens of the country to understand how a nation of seventy million could have difficulty in going to war with one of only seventeen million. He continued, however,

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<sup>89</sup>Ibid., p. 1376; NYT, February 1898, p. 3; 4 February 1898, p. 3.

<sup>90</sup>NYT, 18 February 1898, p. 6; 22 February 1898, p. 1; 27 February 1898, p. 18.

<sup>91</sup>SAL 30: 274: 56 (9 March 1898).

<sup>92</sup>NYT, 8 March 1898, p. 6; 10 March 1898, p. 6.

that military men had not been able to get public attention from their annual reports alone. If a war scare was what it took to get the \$50 million appropriation, it was worth it, for more could be done in weeks and months than would otherwise be accomplished in years.<sup>93</sup>

Although the Army was grossly unprepared for a land campaign in Cuba, particularly in the area of logistics, the entire \$16 million of the appropriation earmarked for the army was allotted to improvement of fortifications.<sup>94</sup> As might have been expected, the attempt was less than successful. As a contemporary analyst observed:

The government that has been niggardly in making military preparations in time of peace must pay the piper and be lavish when war is imminent. It must also scour the markets of the world, to procure what ought to have been done at home.<sup>95</sup>

Although any naval war would provide a test of American's new and as yet untested fleet, the worries of the planners were less with regard to Spain alone as an enemy than at the possibility of her alliance with more formidable naval powers.<sup>96</sup> In the United States Navy's war plans for a war with Spain, naval planners had admitted in 1897 that Spanish ships could probably penetrate a blockade of Cuba, and they proposed raiding the Spanish coast to deter Spanish ships from entering coastal waters of the United States after coaling in the Caribbean.<sup>97</sup> However, when war came, word soon

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<sup>93</sup>Ibid., 29 March 1898, p. 8.

<sup>94</sup>Millis, The Martial Spirit, p. 118.

<sup>95</sup>Hilary A. Herbert, "The Fifty Million Appropriation and Its Lessons," Forum 25 (May 1898): 269.

<sup>96</sup>Ibid., pp. 268-269.

<sup>97</sup>U.S., Navy, "Plans of Campaign Against Spain and Japan," 30 June 1897, p. 43, quoted in John A. S. Grenville, "American Naval Preparations for War with Spain 1896-1898," Journal of American Studies (April 1968): 33-47.

reached the cities on the east coast of the United States that a Spanish fleet had sailed for America. The population of the seaboard states and some of the more excitable naval planners felt that the squadron would coal at Cuba or Puerto Rico and move north to shell the harbors of the Gulf or east coast of the United States.<sup>98</sup> In the coastal cities, panic ensued and the Navy was forced to change its plans for a naval offensive against Spain in Cuba, and had to station a "Flying Squadron" of warships at Hampton Roads to protect the eastern seaboard.<sup>99</sup> The funds that had been so impossible to appropriate earlier were now squandered in a rush for defenses. Whatever else it may have done, the war demonstrated to Congress that any war with a greater naval power than Spain during this period could have had grave consequences, given the lack of coastal defenses.<sup>100</sup>

Congress continued to throw money at the problem of coast defense through the early summer, passing deficiency appropriations bills of \$3.32 million for coast defenses in May and \$5.34 million for coast defenses in July.<sup>101</sup> The regular appropriations bill provided \$9.83 million,<sup>102</sup> and, as mentioned, the Army was given \$16 million of the \$50 million

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<sup>98</sup>Edgar S. Maclay, History of the Navy from 1775 to 1902, 3 vols. (New York: D. Appleton & Co., 1902), vol. 3. pp. 251-252.

<sup>99</sup>For a description of the seaboard panic see Millis, The Martial Spirit, pp. 201-204. For modifications of naval plans, see Harold and Margaret Sprout, The Rise of American Naval Power 1776-1913 (Princeton: n.p., 1939), p. 234, quoting U.S., Congress, 55th Cong., 3rd Sess., "Annual Report of the Secretary of the Navy, 1898," House Documents, no. 3, p. 4; and W. W. Kimball, "Insurance of Property Against War Risks," Forum 27 (1899): 423-424.

<sup>100</sup>Edward Ranson, "The Endicott Board of 1885-86 and the Coast Defenses," Military Affairs (Summer 1967): 84.

<sup>101</sup>SAL 30: 396: 235 (4 May 1893); 30: 704: 571 (7 July 1898).

<sup>102</sup>Ibid. 30: 400-403: 248 (7 May 1898).

appropriation, all for fortifications. Apparently, almost \$35 million was available for spending on fortifications in fiscal year 1898. Not surprisingly, an engineer officer could say by fall that the work of five years had been done in three months, for mounted guns had risen from 106 to 291 and emplacements from 387 to 530.<sup>103</sup>

An effect of the Spanish-American War almost as important as the conversion of Congress to coast defense advocates was the conversion of the doyen naval strategist of America, Alfred Thayer Mahan, to the cause of armed fortifications for coast defense. Mahan's pre-eminence as a thoughtful naval analyst had been recognized since the publication in 1890 of his masterpiece, The Influence of Sea Power upon History, 1660-1783. His silence in this work on the subject of fixed fortifications had left some strategists with the implication that the best coastal defense was a strong navy to give mobile protection at any point on the coast. With the experience of the Spanish-American War, when the Navy was forced to abandon its war plans of attacking Spain in the North Atlantic in order to provide a credible defense of the eastern seaboard, Mahan became convinced that coastal fortifications were an indispensable adjunct to a strong navy for the United States.

Mahan quickly became one of the most famous, the most articulate, and the most convincing proponent of coastal fortifications in the United States. He wrote a group of articles which were published as Lessons of the War with Spain in 1899, succinctly arguing the Navy's case for a comprehensive system of coastal fortifications. He explained his earlier silence on coastal fortifications as owing to a conviction that they were a "constant element" of coast defense. He admitted the navy was inferior to coastal

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<sup>103</sup>NYT, 30 October 1898, p. 14.

fortifications as a defensive deterrent and that coastal fortifications were decisively superior to ships in a harbor defense role.<sup>104</sup> Partly to gain bipartisan political support, naval advocates in the United States had promoted their navy as one "for defense only," but Mahan now explained that the phrase had not implied that the navy was to be used for coastal and harbor defense, but rather to defend the country by striking at the aggressor's navy.<sup>105</sup> To Mahan, coastal fortification was "the true and necessary complement of an efficient navy, [which] releases the latter for its proper work--offensive."<sup>106</sup>

Mahan felt that the marriage of coastal fortifications and the strong Navy of the United States was not one of convenience, but one made in heaven, for "coast defenses and naval forces are not interchangeable things; neither are they opponents, one of the other, but complementary . . . however perfect . . . either may be, the other is necessary to its completeness."<sup>107</sup> The Navy should have been free from a harbor defense role; instead, the inadequate nature of United States coast defenses had imposed a "vicious, though inevitable, change in the initial plan of campaign" which had envisioned the war fleet being directed in full force against the Cuban coast.<sup>108</sup> The fact that this diversion was not particularly harmful in the

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<sup>104</sup>Alfred Thayer Mahan, "Current Fallacies Upon Naval Subject," Harper's Monthly Magazine, June 1898, published in Lessons of the War with Spain and Other Articles (Boston: Little, Brown, & Co., 1899), p. 287 and Preface, pp. xi-xii.

<sup>105</sup>Ibid., p. 279.

<sup>106</sup>Alfred Thayer Mahan, "Lessons of the War with Spain," published in ibid., p. 58.

<sup>107</sup>Ibid., p. 48.

<sup>108</sup>Ibid., pp. 53-54, 56.



war with Spain was entirely owing to luck and a poor Spanish navy; in a future war with a stronger navy or even another weak one with more aggressive commanders, such a diversion could bring defeat. Foreseeing Germany as a possible future enemy, Mahan warned that a similar lack of prudent preparations could be disastrous.<sup>109</sup> Along with other contemporary naval strategists, Mahan felt that the Spanish navy could have made an effective, if short-lived, attack on the American coast;<sup>110</sup> the psychological element of such an attack would have been as important as the physical damage it could have caused.

In Mahan's view, as in that of the Endicott Board and most American strategists, the United States was protected from invasion by her long coast line, which had only a few major population centers, and her isolation from hostile powers; thus her coast defense strategy could be considered, in reality, a harbor defense strategy.<sup>111</sup> If the large coastal cities were satisfied with their safety from attack, the smaller coastal cities would be safe by virtue of their insignificance. With such a psychological perception of their security, a coastal panic like that of the Spanish-American War could be avoided in a future war.<sup>112</sup> Even though the panic had resulted from an exaggerated concept of Spanish naval capabilities, its effect had been to pull the teeth of the United States Navy on the high seas by requiring a naval coast defense squadron to be stationed at Hampton Roads.<sup>113</sup>

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<sup>109</sup>Ibid., p. 288 ff.

<sup>110</sup>Ibid., p. 57; also see Maclay, History of the Navy, vol. 3, pp. 25, 252.

<sup>111</sup>Mahan, Lessons, p. 16.

<sup>112</sup>Ibid., pp. 54, 68.

<sup>113</sup>Ibid., p. 58.

The conversion of such an important naval thinker as Mahan from a position of "benign neglect" of fixed fortifications to one of determined advocacy had a dramatic effect. Mahan's backing and the impetus provided by the war caused Congress to become convinced, and funds were appropriated for a strong and continuous building program. By 1906, President Roosevelt appointed a new board for virtually the same purposes as those of the Endicott Board, that is, analyzing and making recommendations on the question of fortifications and coast defense. The report of the 1906 board provides some insights in analyzing the Endicott Board's recommendations. The later board was headed, as the earlier board had been, by the Secretary of War, at this time, William H. Taft. In the letter transmitting the later report to Congress, President Theodore Roosevelt called the principles of the Endicott Report "as applicable to-day as when formulated," and said:

The necessity for a complete and adequate system of coast defense is greater to-day than twenty years ago, for the increased wealth of the country offers more tempting inducements to attack, and a hostile fleet can reach our coast in a much shorter period of time. The fact that we now have a navy does not in any wise diminish the importance of coast defenses; . . . It is an accepted naval maxim that a navy can be used to strategic advantage only when acting on the offensive, and it can be free to so operate only after our coast defense is reasonably secure and so recognized by the country.<sup>114</sup>

Roosevelt argued that the success of the Japanese fleet in the recent Russo-Japanese War resulted from its freedom to seek out the Russian fleet because of the security of the Japanese harbors.<sup>115</sup> Concerning the validity of the earlier report, the Taft Report says:

The Endicott Board's report was submitted in 1886. The principles of seacoast defense, so clearly stated therein, and the necessity of having our important strategic and commercial centers made secure against naval attack, with as little delay as possible, are equally

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<sup>114</sup>"The Taft Report," pp. 3, 4.

<sup>115</sup>*Ibid.*

applicable to-day and need not be repeated.<sup>116</sup>

Taft, however, did not hesitate to criticize the Endicott Report in areas where its recommendations had been proved deficient in the intervening decades. The Endicott Report had not provided for ammunition for its new weapons, a not insignificant oversight, nor for the land purchases for the fortifications, a tremendous sum. Additionally, but not foreseeable in 1885, Britain's secure friendship after 1896 had allowed plans for defense of the Great Lakes ports to be deleted.<sup>117</sup> But the greatest modification in the recommendations of the earlier report was in another area for which Endicott and his associates could not be faulted, that of the performance of the new weapons.

As the Taft Report stated, "The continued improvement in the quality of steel and in the manufacture of a powder, which increased the power of the gun, and . . . the production of a satisfactory disappearing carriage adaptable to the weights of the heavier guns . . ." <sup>118</sup> gave far higher levels of performance than could have been foreseen by the board in the 1880's. This improved performance, both in rates of fire and in power of the new weapons, had allowed much of the expensive machinery for lifting the guns into position to be deleted and had allowed a substantial reduction in the number of guns required for adequate defense.<sup>119</sup> "Floating batteries," the expensive mobile gun platforms, had become unnecessary and were eliminated. Thus it was possible to reevaluate the total amount of armament

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<sup>116</sup>Ibid., p. 10.

<sup>117</sup>Ibid., pp. 3, 5, 6.

<sup>118</sup>Ibid., p. 13.

<sup>119</sup>Ibid., pp. 2, 9.

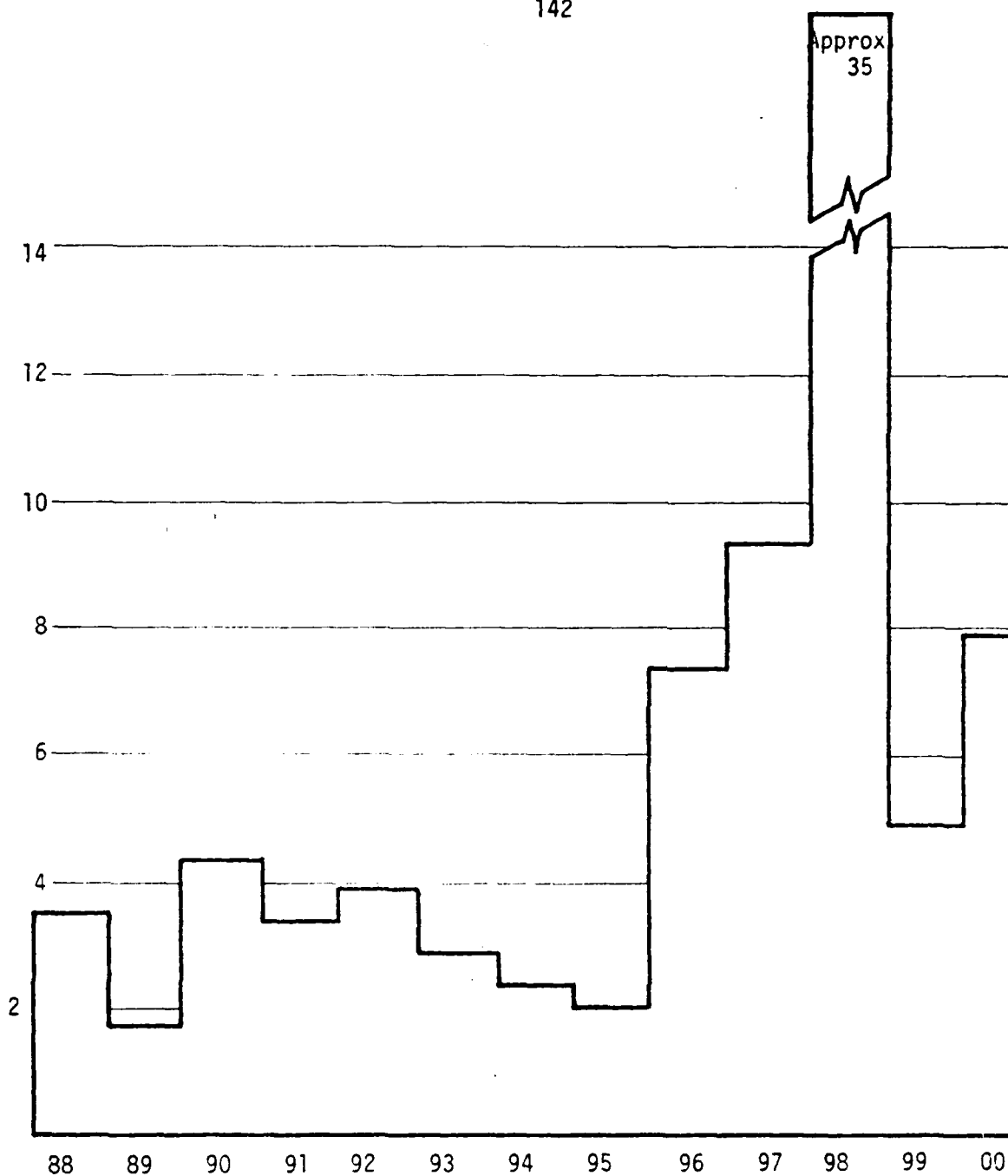


FIGURE 6

Appropriations for Coastal Defense, 1838-1900, in Millions of Dollars. (N. B. Appropriations available only for contracts with private firms for finished ordnance are omitted: see Figure 5.) Source: SAL, Fortificati Appropriations bills for years indicated.

recommended in 1885, and realize considerable savings in gross expenditures.<sup>120</sup>

Given the perspective of a century, the thoughtful analyst studying how the United States provided for coastal defense in the late nineteenth century arrives at conclusions which must be carefully weighed with respect to one another. First, it seems apparent that given the problems inherent in predicting technology, the Endicott Board of 1885 made cogent recommendations for coast defense. Second, the Congress of the United States failed to implement these recommendations until external threats to the coasts became manifest, too late to get the defenses into place against an opponent. Third, in spite of the lack of action by Congress, the nation was not harmed; in fact, one could say that the United States acquired a better coast defense system by procrastinating for a decade than it would have had if the recommendations of the Endicott Board had been immediately implemented.

For the twentieth century defense planner, however, the key point in the question of coastal defenses is not the serendipitous result of the nineteenth century case history, but how that result was arrived at, and what risks were involved in the process. To look at this process and its risks, we must return to the paradigm of defense planning in the United States.

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<sup>120</sup>Ibid., p. 9.

## ECHOES FROM THE PAST

To conclude this case study by maintaining that it holds explicit "lessons" for the defense planner a century later which presage parallel developments would be to place a greater burden on the study than it can bear. Nevertheless, it would not be inappropriate to examine some of the characteristics of the process by which the United States planned for defense in the last decades of the nineteenth century in an effort to illuminate analagous characteristics of the process in the twentieth century.

By returning to the paradigm of modern planning for defense, the actions of the publicists, planners, and politicians may be examined individually as they played their roles in the question of coastal defenses. In analyzing these actions, one must remember that the groups are not fixed and discrete, but that an individual may perform two or three roles at different times. Thus a military officer may play the role of a publicist in advocating strong coastal defenses when speaking to a Chamber of Commerce, yet be a planner when recommending specific measures to Congress. Likewise, a legislator may act as a publicist in an article on coast defense, as a planner in formulating recommendations in congressional committees, and as a politician in building a consensus for the final bill.

The publicists<sup>1</sup> of coastal defense proposed a wide spectrum of solutions to the problem; characteristically, these thinkers did not limit their ideas to proposals which were realistic and feasible. Some of them saw the isolation of the United States as a factor precluding any need for improved coastal defenses. Others felt that the U.S. Navy alone was adequate protection for the shores. Still others believed that the country needed better fortifications and ordnance as well as a strong navy. Technology sometimes appeared to offer a comparatively easy and inexpensive solution to the problem; had the dramatic technological proposals such as maneuverable torpedoes, the dynamite gun, or the multi-charge cannon lived up to their advertised potential, the country might have had a less expensive and time-consuming program of coastal defenses. The publicists were not forced to take account of important factors such as the costs of their proposals or the changing international situation, although some of them did so.

The planners for coastal defense examined the proposed plans and translated some of them into specific recommendations for congressional action. Planners considered the technological revolution in heavy ordnance, the capabilities of other countries in ordnance manufacture, potential international crises, and the long lead time required for building modern fortifications and ordnance. They were forced to consider carefully the costs of the new technology and to make a precise analyses of proposed weapons. Although proponents could claim fantastic capabilities for their inventions, and publicists could be credulous in accepting and advertising

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<sup>1</sup>It may be helpful at this point to recall the formal definition of publicist as a "writer on current public topics; a journalist who makes political matters his speciality." The Compact Edition of the Oxford English Dictionary, 2 vols. ([New York]: Oxford University Press, 1971), vol. 2, p. 2349.

them, the planners had to appraise the efficacy of the weapons scientifically. Not surprisingly, many of the inventions were deemed to be worthless by the planners, giving the planners a reputation as obstacles to innovation.

The nineteenth-century politicians who alone could transform plans into actions were motivated by many of the same influences which cause modern Congressmen to behave as they do. All of the factors which influence legislative voting behavior are too complex for precise analysis in a study of this scope. Nonetheless, some insights can be gained by looking at the reasons Congressmen gave for their opposition to coast defenses and by inferring some of the other unstated factors which seem to have influenced their votes.

The preceding chapters have shown that Congressmen offered a variety of rationales for not advocating strong coast defenses. Most were variants of a few themes: the proposed defenses were too expensive; the Navy was a better form of coast defense than shore-based fortifications; the state of the art was not far enough developed for the optimum cannon design to be available; cannon should be built by private manufacturers (preferably in the home district of the spokesman!), not by the government in federal arsenals; coast defenses could be improvised in time of crisis; and finally, they saw no existing maritime threat to the United States. If we examine each rationale in turn, we find that all except the last had been effectively refuted by the early 1890's.

The estimate of the Endicott Board for coast defenses was \$26 million, if construction were begun in 1886 and continued for twelve years; that is, less than two million dollars per year after "start-up" costs were made the first year. The Congress was annually voting funds in comparable amounts both for naval construction and for improvements for rivers and



harbors. Additionally, by the early 1880's, several of the expensive proposals for coast defense had been technologically superceded. But the actual amounts required, while reduced below the estimates of the Endicott Board in some areas, had to be increased markedly for purchases of land and ammunition, which the Board did not consider in its initial appraisal.

Many spokesmen in Congress and in the military services had long avowed that the Navy was not the most efficient or economical means of coast defense. The purpose of the Navy was to strike at the vessels and coastlines of the enemy, not to defend the coasts of the United States. Additionally, the Navy was far more expensive than defenses based on shore in terms of initial costs, maintenance expenses, and its fast obsolescence. Although advocates of both coast defense and the Navy had made these points in and out of Congress, their validity only slowly came to be appreciated by the politicians.

At the time the Endicott Board made its report, the argument that the state of the art would soon surpass existing designs for ordnance had a good deal of validity. However, once the technological revolution had taken place, by approximately 1890, designs were substantially as they would remain for decades.

Advocates who maintained that private industry should manufacture ordnance cannot be faulted in the early years after the Endicott Report. Certainly private manufacture was in the American tradition of free enterprise, and would have added a potent lobbying force to the otherwise weak consensus for coast defense. Whether or not a continual annual appropriation of funds for privately built weapons would have eventually resulted in the production of guns of equal or superior quality to those manufactured by the government can not be answered. The fact is that the appropriations Congress made were too small and too uncertain of continuation to encourage

steel makers to make the substantial capital investment necessary to fill the contracts for ordnance. By the early 1890's, the few contracts for finished weapons were being filled with delivery of defective guns after long delays, causing Congress to abandon the concept of private manufacture without a truly satisfactory trial.

Congressmen who believed and argued that effective defenses could be improvised when a crisis came were largely dismissed by advocates of stronger defenses as chauvinistic dreamers. The "improvisers" did not understand the developments which had occurred in military technology in the years since the Civil War. But dismissing their arguments did not make them less attractive, and seldom made them less persuasive to the group of Americans in and out of Congress who wished to avoid spending for defense. If the public or the Congressmen failed to study or to believe how the technology of war had changed, proponents of increased appropriations could do little to change their blissful ignorance.

Finally, the irrefutable argument: If one believed that American foreign policy would remain unchanged, then there was no credible maritime threat to the United States. All but the most ardent advocates of coast defense had to admit that most of the scenarios of potential wars were fanciful if one accepted the premise that American foreign policy was static. Many held this view, for it was an attractive one. Free in her geographic isolation from the defense worries of European powers, the United States might never have occasion to use her coastal defenses. Yet the nation's foreign policy was in transition. For the perceptive observer, there could be no mistaking the signs that foreign relations in the twentieth century would be different from what they had been in the nineteenth. Samoa, Hawaii, the Isthmian canal question were all harbingers of the crises over the Venezuela boundary and the Cuban revolutions: not that

crises were inevitable, but that they were possible and even probable.

Most influences on Congressional voting can only be inferred, but, as recounted in the foregoing chapters, party and regional politics were irrefutably present. Although measures for coast defense were inescapably questions of national defense policy, they were unfortunately perceived as regional measures. At first there were debates which pitted coastal legislators against those of the interior. As it became evident that only the great harbors, not the entire coastlines, would receive the largesse, the question turned to one which pitted the small number of Congressmen who represented the large ports against the representatives of the rest of the country. Party politics were always a factor, whether subtle, as in the case of the relative isolationist tendencies of the parties, or blatant, as in the case of Congressmen being reluctant to vote funds which an administration of the opposing party would get credit for obtaining. These less tangible influences cannot be measured, but their existence was articulated in Congress and in the press, and they manifestly had their effect on legislation. To say that Congressmen, individually and collectively, sometimes based their decisions more on political factors than on the "national welfare" is not to accuse them of ulterior motives, but to state a fact of political life: a Congressman would have had to be exceedingly idealistic to vote on a measure in a way that would have contributed to his defeat in the next election. In the absence of a palpable threat to the coasts, there was no political advantage to the individual Congressman in voting for their defense.<sup>2</sup>

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<sup>2</sup>The allegation that there was no "politics" in coast defense was a view of, among others, the eminent contemporary military historian, T. A. Dodge. See, Theodore Ayrault Dodge, "The Needs of Our Army and Navy," Forum 12 (October 1891): 258, and Editorial, NYT, 23 July 1890, p. 4.

The debates over how much and what type of coastal defenses the United States should have were marked by three characteristic imperatives. The economic imperative which sought to minimize defense spending and the military imperative which sought to minimize risks were mediated by the political imperative which sought to meet public expectations.<sup>3</sup> These imperatives converted when the threats (particularly the Venezuela boundary dispute and the Spanish-American War) were manifest, but diverted during the years preceding the threats. During periods of peace, the long lead time necessary to construct guns and fortifications for future conflicts was not a persuasive factor for the politicians, although to the planners it was of overriding concern. When war came, however, the economic imperative lost its importance for the moment and Congress provided far more money that could be effectively spent in the short time available for improvising defenses.

The twentieth century student of defense policy should be hesitant in taking the view that defense planning has become removed from political problems similar to those of the nineteenth century, or that legislators have become apolitical regarding the nation's defense. Formal planning for weapons and forces a decade in the future have not overcome the inherent dilemma between planning and funding for military policies in peacetime, as the following paragraphs from a current newsweekly illustrate.

It can be maintained, in fact, that a nation's most fundamental social-welfare obligation to its citizens is to defend them against attack. The responsibility for this is entrusted to the armed forces, but the U.S. military has been denied sufficient resources to fulfill the responsibility. Catching up now is certain to be expensive. How much it will cost and how long it will take are urgent questions that the mounting debate on national defense will have to resolve. What exactly is the price of power?

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<sup>3</sup>D. H. Roe, "Thoughts on Force Levels, Risk, and Dollars," ([Washington: Research Directorate, National Defense University, 1979]), p. 2. (Xeroxed.)

Even more critical perhaps is another question: Are Americans willing to pay the price? . . . deciding what to do will test the nation's confidence and nerve as well as its ability to see issues in a long-term perspective. It will also require a challenging self-examination in which the U.S. weighs its role as a [world] power and balances the inherent heavy burdens against the benefits. How such a process turns out could set America's course for the closing decades of the century.<sup>4</sup>

Surely it is not unreasonable or unduly idealistic to suggest that the process of planning and deciding on matters of national defense should be characterized above all by rationality. Nevertheless, the processes actually employed by the United States--in the past and at the present time--give every evidence of a high degree of irrationality. Plans for defense are made by experts who attempt to weigh the myriad variables of foreign and defense policy, but the decision on whether or not to implement these plans is made with far different and less rational criteria. Instead of questioning the parameters of the planners (who after all are human and subject to miscalculation) the legislative process, during peacetime, more often decides on grounds of politics, region, or the perceived interests of local constituencies which are all too often entirely parochial in outlook.

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<sup>4</sup>Don Sider and Burton Pines, "The Price of Power," Time, 29 October 1979, p. 33.

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. U.S. Coast Artillery School. Historical Sketch of the United States Artillery School. Fort Monroe, Virginia: U.S. Coast Artillery School, 1887.

. U.S. Coast Artillery School. Material and Appliances for Moving Heavy Ordnance, by L. A. Chamberlain. Fort Monroe, Virginia: U.S. Coast Artillery School, 1873.

. U.S. Coast Artillery School. Role and Organization of Sea Coast Batteries, by V. Fabre. Fort Monroe, Virginia: U.S. Coast Artillery School, 1890.

### 3. Secondary Sources

#### A. Books

Andrist, Ralph K., ed. The American Heritage History of the Confident Years. New York: American Heritage Publishing Company, 1969.

Profusely illustrated popular history of the U.S. from the end of reconstruction to the eve of World War I; valuable for appreciating the developing imperialist sentiment in the U.S.

Bright, Samuel Raymond. "Coast Defense and the Southern Coasts Before Fort Sumter." Ph.D. Thesis, Duke University, Durham, North Carolina, 1958.

Good outline of coastal defenses examined by Endicott Board and outdated by technological revolution.

Brodie, Bernard and Fawn M. From Crossbow to H-Bomb. Bloomington, Indiana: Indiana University Press, 1973.

Excellent non-technical narrative of the role of technology in warfare.

Ferrell, Robert H. American Diplomacy: A History. New York: W. W. Norton and Company, 1975.

Late 19th century portion places America's emergence as a world power in perspective as a slowly increasing series of international involvements rather than as a sudden emergence.

Flick, Alexander Clarence, assisted by Gustav S. Lobrano. Samuel Jones Tilden: A Study in Political Sagacity. New York: Dodd, Mead & Co., 1939.

Provides a detailed breakdown of Tilden's interests in iron mining and production, but no mention of his letter recommending an expanded program of fortifications.

Hogg, Ian V. A History of Artillery. London: Hamlyn, [1974].

Holt, W. Stull. The Office of the Chief of Engineers of the Army: Its Non-Military History, Activities, and Organization. Institute for Government Research: Service Monographs of the United States Government No. 27. Baltimore: Johns Hopkins Press, 1923.

Although limited to non-military history, this work shows the disparity between Congressional willingness to provide funds for "pork barrel" projects and their reluctance to provide funds for fortifications before 1890.

Hughes, Quentin. Fortress: Architecture and Military History in Malta. London: Lund Humphries, [1969].

A history of the military architecture of Malta, this book is most interesting in what it omits: it covers the fortifications to the 1890's in 240 pages while the modern fortifications are given only three paragraphs.

Huntington, Samuel P. The Common Defense: Strategic Programs in National Politics. New York: Columbia University Press, 1961.

This work generalizes on how and why defense policies are made in one direction and not another in a period of transition (1945-1960). Insights into the politics of defense are penetrating and extremely helpful in understanding a question of enormous complexity. Parts I, V, and VI are particularly relevant to this paper.

The Soldier and the State: The Theory and Politics of Civil-Military Relations. Cambridge: Belknap Press, Harvard, 1959.

A readable and prescient analysis of civil military relations in American history with implications for modern defense planning.

Huzar, Elias. The Purse and the Sword: Control of the Army by Congress Through Military Appropriations, 1933-1950. Ithaca, New York: Cornell University Press, [1950].

Details complex relationships between Congress and the military regarding military appropriations; dated but useful.

Kolodziej, Edward A. The Uncommon Defense and Congress, 1945-1963. n.p.: Ohio State University Press, [1966].

A stimulating and thought-provoking book on the Congressional role in foreign policy; Chapters I and VIII are particularly good in pointing out deficiencies of the present system in practice and suggestions for evolutionary improvements in funding for defense.

La Croix, Horst de. Military Considerations in City Planning: Fortifications. New York: George Braziller, Inc., 1972.

Provides background on fortifications as a harbor defense measure in history to Napoleon.

LaFeber, Walter. The New Empire: An Interpretation of American Expansion 1860-1898. Ithaca, New York: Cornell University Press, Cornell Paperbacks, [1963].

Useful for an understanding of how American expansion was a logical result of the economic development of the industrial revolution. Good on development of the Navy 1889-1893.

Maclay, Edgar S. History of the Navy from 1775 to 1902. 3 vols. New York: D. Appleton & Co., 1902.

Dated but useful for late 19th century perceptions of American naval history.

Mayhew, David. Congress: The Electoral Connection. New Haven: Yale University Press, 1974.

Provides an interpretation of Congressional behavior as centered on being reelected (in most cases); good on why Congress is likely to pass some legislation and not other.

Mallory, Keith. The Architecture of War. New York: Pantheon, 1973.

Although strictly on 20th century developments, useful for understanding the radical change in fortifications post-1830.

May, Ernest R. "Lessons" of the Past: The Use and Misuse of History in American Foreign Policy. New York: Oxford, 1973.

Excellent guide through the pitfalls and dangers of drawing historical parallels in foreign policy; equally applicable to defense planning.

Millis, Walter. The Martial Spirit. Cambridge: The Literary Guild, 1931.

Excellent narrative history of the Spanish-American War.

Pearson, Drew and Anderson, Jack. The Case Against Congress: A Compelling Incident of Corruption on Capitol Hill. New York: Simon and Schuster, [1968].

This book comprises a series of polemical articles on Congressional weaknesses as observed by a mid-twentieth century muckracker. Used with caution, it can provide insights into the negative side of Congressional behavior.

Pratt, Julius W. A History of United States Foreign Policy. Englewood

Cliffs, New Jersey: Prentice-Hall, 1955.

Chapters 23 through 25 give an excellent outline of the emergence of the U.S. into the world arena.

Polsby, Nelson W. Congress and the Presidency. 3rd ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., [1976].

A concise (206pp.) but thorough treatment of how the executive and legislative branches of the U.S. government function in modern times; readable, witty, and penetrating. Particularly useful for insights into why some proposals are never funded.

Reid, William. Arms Through the Ages. New York: Harper and Row, 1976.

Although an unscholarly "coffee-table book" with numerous omissions, this book has excellent illustrations and some superior descriptions of weapons technology.

Reinhardt, George C., and Kintner, William R. The Haphazard Years: How America Has Gone to War. New York: Doubleday and Company, 1960.

One of the best descriptions of the endemic U.S. unpreparedness for war.

Ritter, Raymond. Chateaux, Donjons, et Places Fortes: L'Architecture Militaire Francaise. Paris: Librairie Larousse, [1953].

Although primarily concerned with medieval and Renaissance fortifications, this study provides a short chapter at the end outlining modern developments.

Rochas d'Aiglun, Albert de. Vauban. Paris: Berger-Lerrault & Cie., 1910.

Better than most works that are written in English on Vauban's developments in fortifications.

Russett, Bruce M. What Price Vigilance? The Burdens of National Defense. New Haven: Yale University Press, 1970.

This work from a quantitative "social engineering" perspective provides some limited insight into voting behavior of Senators on defense issues; the author's bias in writing at the height of the Vietnam war is evident throughout.

Schilling, Warner R.; Hammond, Paul Y.; and Snyder, Glenn H. Strategy, Politics, and Defense Budgets. New York: Columbia University Press, 1962.

In three monographs, this book explores individual policy changes of the post-WWII era (the 1950 defense budget, NSC-68, and the 1953 "New Look"); the first provides conceptual paradigms particularly relevant to this paper.

Sprout, Harold and Margaret. The Rise of American Naval Power, 1776-1918. Princeton: n.p., 1939.

Good narrative of the rebuilding of the Navy after 1880.

Weigley, Russell F. The American Way of War: A History of the United States Military Strategy and Policy. Bloomington, Indiana: Indiana University Press, [1972].

Chapter 9, "A Strategy of Sea Power and Empire: Stephen B. Luce and Alfred Thayer Mahan" provides a concise overview of the revolution



in naval strategy and doctrine caused by technological and expansionist forces.

. History of the United States Army. New York: The Macmillan Company, [1967].

Good for placing the fortifications controversy within the context of the U.S. 19th century army. Chapter 12 provides an illuminating picture of the "dark ages" of the American Army from 1865-1898; useful particularly in conjunction with Chapter 9 of Weigley's The American Way of War to understand the contrast between situations in the Army and Navy during the period.

White, Leonard D. and Schneider, Jean. The Republican Era, 1869-1901: A Study in Administrative History. New York: MacMillan Co., 1958.

Provides numerous insights into administrative workings of the Army and Navy Departments (in addition to the other bureaus of the Federal Government) as well as their place in the overall bureaucracy of the day.

Yarmolinsky, Adam. The Military Establishment: Its Impacts on American Society. New York: Harper and Row, [1971].

A biased book that reflects its authorship at the height of the Vietnam involvement, but with many perceptive insights and observations; Chapter 7 particularly supports the thesis that consensus for military spending is directly related to the perceived external threat.

#### B. Periodicals and Articles

Davis, Vincent. "The Politics of Innovation: Patterns in Navy Cases." [1966] in Head, Richard G., and Rokke, Ervin J. American Defense Policy. 3rd ed. Baltimore: Johns Hopkins University Press, [1973]: 391-406.

Although specifically concerned with Navy cases, this article has revealing observations on how advocates of innovation promote their programs that can be applied to other defense programs.

Dexter, Lewis Anthony. "Congressmen and the Making of Military Policy." in Bobrow, Davis B., ed. Components of Defense Policy. Chicago: Rand McNally & Co., [1965]: 94-110.

Although dated by being pre-Vietnam, this article relies on interviews with 100 Congressional committee members and their staffs and legislative liaison personnel from the Department of Defense.

Gibson, George C. "Congressional Attitudes Toward Defense." [1972] in Head, Richard G. and Rokke, Ervin J. American Defense Policy. 3rd ed. Baltimore: Johns Hopkins University Press, [1973]: 358-369.

Grenville, John A. S. "American Naval Preparations for War With Spain, 1896-1898." Journal of American Studies 2 (April 1968): 35-47.

Analysis of naval plans; includes naval plans against Japan at same time. Provides extended quotes of plans.

Halperin, Morton H. "Why Bureaucrats Play Games." [1971] in Head, Richard G. and Rokke, Ervin J. American Defense Policy. 3rd ed. Baltimore: Johns Hopkins University Press, [1973]: 301-310.

This article examines the U.S. decision to abandon development of the Skybolt mission as a case study in how bureaucracies adopt positions using their own self-interest as manifestations of the national interests.

Huntington, Samuel P. "Strategic Planning and the Political Process." in Bobrow, Davis B., ed. Components of Defense Policy. Chicago: Rand McNally & Co., [1965].

Although dated (written 1960) this article provides insights into some of the unwieldy aspects of defense planning.

Ranson, Edward. "The Endicott Board of 1885-86 and the Coast Defenses." Military Affairs (Summer 1967): 74-84.

One of the only modern studies of the Endicott Board, but more concerned with its effects on the reorganization of artillery than with legislative problems.

Robinson, Willard B. "Military Architecture at Mobile Bay." Journal of the Society of Architectural Historians 30 (May 1971): 119-139.

\_\_\_\_\_. "North American Martello Towers." Journal of the Society of Architectural Historians 33 (May 1974): 152-164.

Since Endicott period fortifications are scarcely mentioned, these articles by Robinson serve to show how little architectural historians are interested in modern military architecture.

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